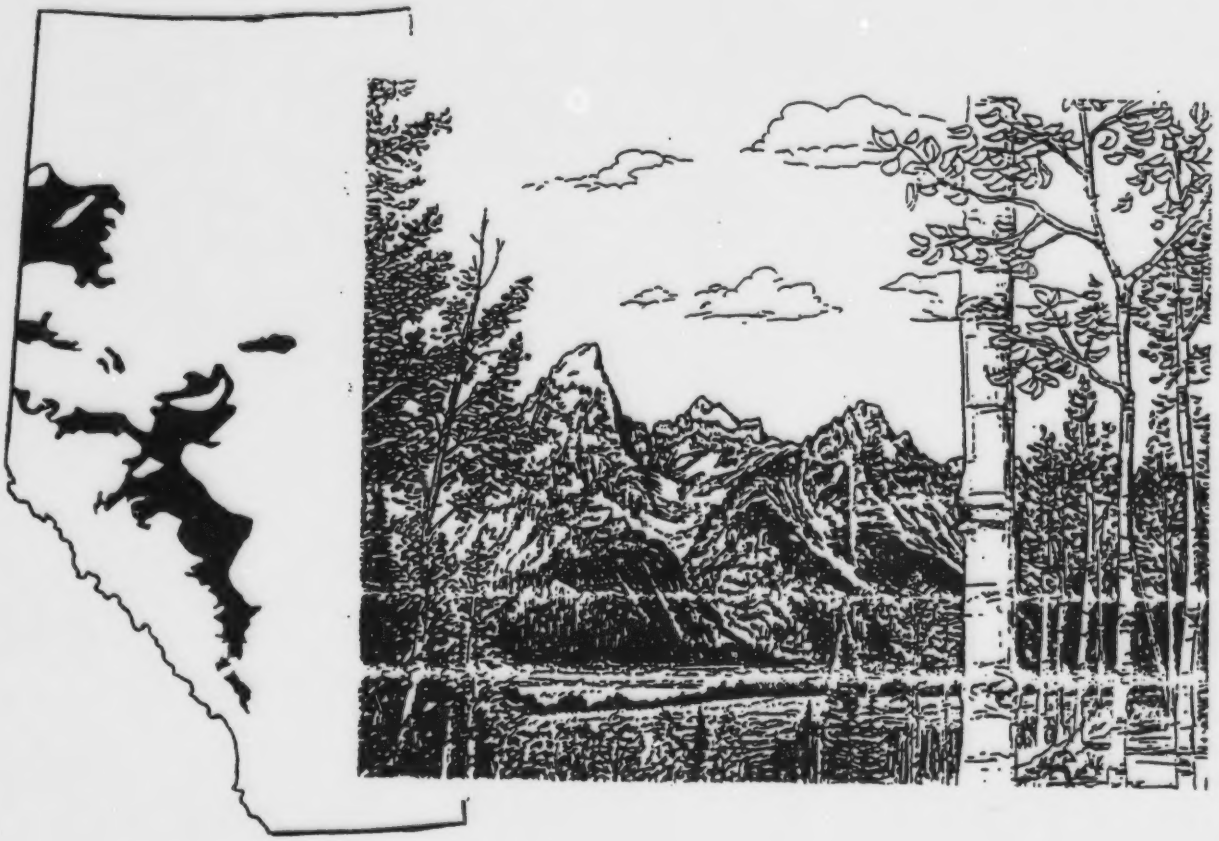
RANGE PLANT COMMUNITY TYPES AND CARRYING CAPACITY GUIDE

FOR THE

LOWER FOOTHILLS SUBREGION



Alberta
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AGRICULTURE, FOOD AND
RURAL DEVELOPMENT
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RANGE PLANT COMMUNITY TYPES

AND CARRYING CAPACITY

FOR THE

LOWER FOOTHILLS SUBREGION OF ALBERTA

Third Approximation

2000

Prepared by

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Forest Rangeland Action Plan Teams

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FORWARD

In January, 1999 a joint Land and Forest Service (LFS) and Agriculture, Food and Rural Development (AFRD) project, called the Rangeland Health Assessment Project[1] was initiated. Its purpose is to coordinate the development of rangeland health assessment methods and ecological site descriptions for both forested and grassland dominated rangelands in the province and transfer the new technology (awareness, information and tools) to livestock producers, staff and other stakeholders.

This project has given rise too two action plans: 1.) Prairie Rangeland Action Plan (PRAP) and 2.) Forested Rangeland Action Plan (FRAP). This document "Range plant communities and carrying capacity for the Lower Foothills subregion of Alberta, Third Approximation" is a beginning effort of the (FRAP)[2] plan to organize existing range plant community information for the Lower Foothills subregions into an ecological framework in order to develop ecological site descriptions as outlined in the Alberta Rangeland Health Task Group, Terms of Reference (1999). This guide encompasses the work of Karen Sundquist (who worked on previous approximations) and incorporates the work done by Beckingham et.al (1996) and Archibald et. al (1996) on the forested ecosites of the Lower Foothills subregion. A special acknowlegement to Harry Archibald, Landscape Ecologist with Alberta Environment, Integrated Resource Management Division for assisting with the development of this guide and linking it with the ecosite field guides (Table 1a).

As we collect new research information, the third approximation will evolve into a range ecosite field guide. One major outcome of the project will be to produce ecological base information which can be used to develop management tools for northern livestock producers, resource managers and other stakeholders of Alberta's Boreal forests. This new knowledge will aide in the sustainable grazing of forested plant communities, and maintain the good health and proper functioning of these ecosystems.

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Abstract

The Green Area lands of the Lower Foothills Subregion are classic examples of multiple use land. They provide summer range for livestock, primary habitat for wildlife, productive watersheds, timber and recreational areas. Despite the importance of many of these communities for livestock grazing, there is very little information on forage production, carrying capacity and how they are influenced by grazing. This lack of information makes it very difficult to develop management prescriptions that address multiple use objectives. As a result "Carrying Capacity Guides" are being developed for each Natural and Subregion in the province to provide a framework that will easily group the vegetative community types. It is hoped that these guides will be used by field staff to assess carrying capacity and evaluate range condition on lands within each region.

This guide represents the analysis of 1205 plots described in the Lower Foothills Subregion of Southern, North East Slopes and North West Boreal Forest regions during the summers of 1990-1999. The 1205 plots represent 129 community types. These are split into:

a: Tame Grasslands	15 community types
b: Native Grasslands	8 community types
c: Native Shrublands	10 community types
d: Grazed modified Native Grasslands and Shrublands	5 community types
e: Aspen forest types	16 community types
f: Balsam poplar - aspen forest types	13 community types
g: Grazed modified Aspen forest types	4 community types
h: Mixedwood forest types	12 community types
i: Grazed modified Mixewood forest types	1 community types
j: Conifer forest types	21 community types
k: Grazed modified Conifer forest types	2 community types
l: Harvesting/burn modified forest types	17 community types
m: Grazed modified Harvesting/Burn forest types	5 community types

The dominant plant species, canopy cover, environmental conditions, response to grazing, forage production and carrying capacity are outlined for each type. Total forage production sampling (shrubs, forbs, and graminoids) equals 585 sample plots.

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Introduction:

In recent years, increased demands have been placed on the provinces land base. These increased demands by resource users requires that these lands be managed for productivity, sustainability, and diversity within a multiple use framework. The first step towards successful management of these lands is a comprehensive understanding of the resource base. The province of Alberta is occupied by a number of vegetation zones, from grassland prairies in the south, to alpine vegetation in the mountains and dense forests in the central and northern portion of the province. The broad vegetation zones of the province have been classified into 6 natural regions and 20 subregions (Alberta Environmental Protection 1994).

The "Green area" lands of the province of Alberta are highly regarded as multiple use lands. They provide summer range for livestock, valuable habitat for wildlife, productive watersheds, recreational areas and timber. The increased use of Alberta's forests has stimulated efforts to develop detailed classification systems of the plant communities that occur within the forested natural regions. Some of these classifications include "Field guide to forest ecosystems of West Central Alberta" (Corns and Annas 1986), "Field guide to ecosites of Southwestern Alberta" (Archibald et al 1996) and "Field guide to ecosites of West-Central Alberta" (Beckingham et al 1996).

Despite the importance of these vegetation types for livestock grazing, there is little information available for individual communities on forage productivity, carrying capacity and the effect that livestock grazing has on the plant community's health and productivity. Traditionally, these community types have been rated at 5 ac/AUM or 60 ac/head/year. However, recent work has shown that productivity can vary significantly depending upon the ecological condition of the site.

The purpose of this guide was to develop a classification system that easily groups the vegetative community types in the Lower Foothills subregion of the province. It is hoped that this classification system could be used by the field staff to assess carrying capacity and assist in the evaluation of range health on lands within the region. This guide supplements the work done by Archibald et al (1996) and Beckingham et al (1996) on the forested community types in the Lower foothills subregion. Their guides provide good descriptions of the forested community types found within the subregion, but do not include forage production values and carrying capacities. Their guides also do not provide a description of the native shrubland and grassland communities which are extensively utilized by livestock in this subregion.

Climatic and Ecological Conditions of the Lower Foothills subregion

Elevationally this subregion is found below the Upper Foothills and above the Boreal Mixedwood subregions. This subregion has a continental climate with a wide amplitude between summer and winter temperatures. The average annual precipitation is 464mm, two thirds of which falls during the summer months. Summer temperatures average 12.8°C and winter temperatures average -7.8°C.

The Lower Foothills subregion is the most arboreally diverse area in Alberta (Strong and Leggat 1992). The mixture of species which can occur is highly dependent upon geographical location and site history. Stands can be dominated by aspen, balsam poplar, lodgepole pine, white spruce, or black spruce. Deciduous-dominated stands are normally found at lower elevations. Secondary succession of these stands is to white spruce. Lodgepole pine-dominated stands develop on rapidly to well drained sites and southerly aspects. Imperfectly drained sites are dominated by lodgepole pine which, with succession, are invaded by white spruce. Black spruce dominates poorly drained depressions throughout the region.

Map 1: Location of the Lower Foothills Subregion in Alberta

Methods

A community type approach (Mueggler 1988) to classification was chosen in preference to the habitat type approach (Daubenmire 1952) or ecosystem association approach (Corns and Annas 1986) because of the lack of understanding of the successional sequences of the communities. Community types are aggregates of similar plant communities based upon existing floristics regardless of successional status (Mueggler 1988). Community types are what is actually seen in the field. After defining the community types, they then can be linked to the ecosystem associations developed by Corns and Annas (1986) and Beckingham (1994). In the mean time community types can be used as the basis for mapping and range management planning. Initially, grazing dispositions were inventoried by forest region in order to develop management plans following the procedure outlined in the Rangeland Resource Information System (1991). Individual plots were initially classified within a forest region using cluster analysis (SAS) and ordination (DECORANA, Gauch 1982). These types were described in individual carrying capacity guides for each forest. This led to differences in classification of the same types between forests, particularly for deciduous forest types. In an effort to standardize the community name and gain some understanding of each community type's ecology, all plots sampled in each forest were reclassified. As the study progressed it became quite evident that there were differences in the productivity of the communities between subregions. As a result, it was decided to develop the classification within the ecoregion framework (Strong and Leggat 1992). An ecoregion is a geographical area that has broad vegetation zones combined with climatic data (Strong and Anderson 1980). As a result, the vegetation within each ecoregion is strongly influenced by the climatic conditions. Recently, the department has adapted the Natural and Subregions of Alberta classification system. This system incorporates the Natural regions and subregions classification used by Parks with the Ecoregions of Alberta classification used by Forestry, Lands and Wildlife. Thus the Lower Boreal Cordilleran ecoregion essentially became the Lower Foothills Subregion. They share approximately the same boundary.

Sampling for this guide occurred within the Lower Foothills subregion. This guide outlines the preliminary classification of 1205 plots described during the summers of 1990 to 1999 in the Southern East Slopes, the Northern East Slopes and the North West Boreal Regions.

A plot consisted of a 10x10 m macroplot and ten randomly selected 1x1 m microplots to record the canopy cover of shrubs and ten nested 20x50 cm microplots to record the canopy cover of forbs and grass. The inventory followed the Range Survey Manual (1992) and uses the MF5 form. At each macroplot the current annual growth on a 50x100 cm area was clipped and separated into trees, shrubs, forbs and graminoids, oven dried and weighed. The recommended stocking rate is based on 25% of the total production for forested types and 50% total production for grass and shrubland types, and the fact that one animal requires 455 kg of dry weight material for one month of grazing.

How to use the guide

First decide what category the community type is in. If the area has been cleared of trees, broken, and seeded down to tame forage species such as timothy of creeping red fescue, the community will be in the **Tame Grass** category. If the area does not have an overstory tree canopy and has not been cleared and broken the community type will fall under the **Native Grass** or **Shrublands** category. The **Deciduous** category includes all plant communities that are dominated by a deciduous tree species overstory canopy, these are separated into two distinct groups, i.e. ***Aspen Community Types*** and ***Aspen-Balsam Poplar-Paper Birch Community Types***. Communities which have begun to undergo succession from a deciduous to a conifer dominated overstory fall into the **Mixedwood** category. Those communities dominated by a conifer overstory, White spruce, Lodgepole pine or Black spruce are classified in the **Conifer** category. The **Cutblock** category contains the communities that occur on sites which have been harvested. Many of these categories have been further classified based on influences of grazing succession. ***Grazed Modified Community Types*** have been created to account for moderate to heavy grazing successional influences on these board categories.

Once the main category has been determined, go through the flow chart(s) (keys) in that category to determine which community type you are looking for. Then turn to that community type to find out the carrying capacity (or suggested stocking rate).

In order to understand how the community types in this guide are related to the ecosites and ecosite phases outlined in "Field guide to ecosites of Southwestern Alberta" (Archibald et al 1996) and "Field guid to ecosites of West Central Alberta" (Beckingham et al 1996), the community types in this guide are summarized by ecosite and ecosite phase in Table 1. Ecosites are defined as ecological units that develop under similar environmental influences (climate, moisture and nutrient regime). An ecosite phase is a subdivision of the ecosites based on the dominant species in the canopy. Table 1 is a combined version of Figure 11 in the Ecosites of South-Western Alberta and Figure 11 in Ecosites of West Central Alberta. The community types described in this guide are highlighted in bold italics in Table 1. The grazing succession category illustrates the successional sequence the community type will undergo with increased grazing pressure. For the most part, the ecosites and ecosite phases were similar, but a number of ecosite phases had to be added to the table in order to describe the grasslands and shrublands. These summaries include, c6 *hairy wild rye grassland, e5 low-bush cranberry shrubland, g1 shrubby meadow_grazed, g3 graminoid meadow, i4 horsetail shrubland*. New ecosite phase summaries where also created to describe the effects of grazing succession, harvesting succession and the influence of combined grazing and harvesting succession on native plant community types. These include *e2 low-bush cranberry_grazed Aw; e2 low-bush cranberry_harvest Aw; e2 low-bush cranberry_harvest_grazed Aw; f2 bracted honeysuckle_harvest Aw-Pb*.

In the rest of the guide, the dominant plant species, canopy, environmental conditions, response to grazing, forage production and carrying capacity of the various community types for the Lower Foothills Subregion are outlined.

Table 1a. Ecosites, ecosite phases, and plant community types of the Lower Foothills subregion (Beckingham et al. 1996, Archibald et al. 1996); range plant community types as well as the influences of grazing and harvesting succession, in bold italics, are found within this guide.

Ecosite	Ecosite Phase	Plant Community Type	*Range Plant Community Type*	*Grazing Succession*	*Harvesting Succession*
a grassland (xeric/poor)	a1 shrubby grassland	a.1 bearberry grassland	***b1 bearberry-juniper/sedge***		
			b2 bearberry/parry's oatgrass		
b bearberry/ lichen subxeric/poor	b1 bearberry Aw-Sw-P1	b1.1 Pl/bearberry/ lichen	***h1 Pb-Sw/chokecherry-bearberry***		
		b1.2 Pl/blueberry/ lichen			
c hairy wild rye (submesic/ medium)	c1 hairy wild rye P1	c1.1 Pl/buffalo-berry/hairy wild rye	***j1 Pl/beary/hairy wild rye***		***l1 white grained mountain grass/bearberry/Pl-Aw***
		c1.1.2	***j2 Pl/bog cranberry/hairy wild rye***		
		c1.2 Pl/green alder/hairy wild rye			
	c2. hairy wild rye Aw	C2.1 Aw/buffalo-berry/hairy wild rye		***g1 Aw/rose/hairy wildrye/clover***	
		c2.2 Aw/green alder/hairy wild rye			

Ecosite	Ecosite Phase	Plant Community Type	*Range Plant Community Type*	*Grazing Succession*	*Harvesting Succession*
		c2.3 Aw/blueberry/ hairy wild rye	***e1 Aw/blueberry***		
		c2.4Aw/bearberry/ hairy wild rye	***e2 Aw/bearberry/fringed brome***		
	c3 hairy wild rye Aw-Sw-p1	c3.1 Aw-Sw-Pl/ buffalo-berry/hairy wild rye	***h2 Aw-Sw/buffalo-berry-bearberry***		
		c3.2 Aw-Sw-Pl/ alder/hairy wild rye			
		c3.3 Aw-Sw-Pl/ labrador tea/hairy wild rye			12 Aw/hairy wildrye/dwarf bilberry-labrador tea
		c3.4 Aw-Sw-Pl/ bearberry/hairy wild rye			
	c4.hairy wild rye Sw	c4.1 Sw/buffalo-berry/hairy wild rye	***j3 Sw/buffalo-berry-bearberry***		l3 buffalo-berry-bearberry/Sw
	c5 shrubland	c5.1	***c1 rose-blueberry/schreber's moss***		
	c6 grassland	c6.1	***b3 california oatgrass/bearberry***		

Ecosite	**Ecosite Phase**	**Plant Community Type**	***Range Plant Community Type***	***Grazing Succession***	***Harvesting Succession***
d labrador tea - mesic (mesic/poor)	d1 labrador tea - mesic - Pl/Sb	d1.1 P1-Sb/labrador tea/feathermoss	***j4 Pl-Sb/labrador tea/feathermoss***		
		d1.2 P1-Sb/alder/ feathermoss			
		d1.3 Pl-Sb/feathermoss	***j5 Pl-Sb/feathermoss***		
	d2 labrador tea - mesic P1	d2.1 Pl/labrador tea/feathermoss	***j6 Pl/labrador tea-bog cranberry***		
		d2.1.1	***j7 Pl/labrador tea-bearberry***		
		d2.2 Pl/bogcranberry			
		d2.3 Pl/feathermoss			
	d3 labrador tea - mesic Aw-Sw-P1	d3.1 Aw-Sw-Pl/labrador tea/feathermoss	***h3 Pl-Sw-Aw/labrador tea/feathermoss***		
e low-bush cranberry (mesic/ medium)	e1 low-bush cranberry P1	e1.1 Pl/green alder	***j8 Pl/alder***		m1 Aw-Pl/alder/clover/ kentucky bluegrass
		e1.2 Pl/low-bush cranberry	***j9 Pl/fireweed***	k1 Pl/kentucky bluegrass/clover	l4 Pl/hairy wild rye/rose
		e1.3 Pl/feathermoss			

Ecosite	Ecosite Phase	Plant Community Type	*Range Plant Community Type*	*Grazing Succession*	*Harvesting Succession*	
	e2 low-bush cranberry Aw	e2.1 Aw/buffalo-berry	***e3 Aw/buffalo-berry***		m2 Aw/buffalo-berry/ clover	
		e2.2 Aw/saskatoon	***e4 Aw/saskatoon***			
		e2.3 Aw/alder	***e5 Aw/alder***			
		e2.3.1	***e6 Aw/alder/marsh reedgrass-hairy wild rye***			
		e2.4 Aw/low-bush cranberry				
		e2.5 Aw/rose	***e7 Aw/rose-low-bush cranberry/tall forbs***	g2 Aw/rose/ strawberry	15 Aw/ marsh reedgrass / rose/ fireweed	16 raspberry/ marsh reedgrass/ Aw
				g3 Aw/rose/clover	m3 strawberry-clover/ rose/marsh reedgrass	
				g4 Aw/kentucky bluegrass/clover	m4 kentucky bluegrass/ clover-dandelion	
		e2.5.1	***e8 Aw/rose-twinflower***			
		e2.6	***e9 Aw/snowberry***			
		e2.7	***e10 Aw/white meadowsweet***			

Ecosite	Ecosite Phase	Plant Community Type	*Range Plant Community Type*	*Grazing Succession*	*Harvesting Succession*
		e2.8	***e11 Aw/hazelnut/wild sarsaparilla***		17 hazelnut/Aw/wild sarsapsarilla
	e3 low-bush cranberry Aw-Sw-Pl	e3.1 Aw-Sw-Pl/buffalo-berry	***h4 Aw-Sw/buffalo-berry***		m5 clover/timothy/ buffalo-berry/Pl-Sw
		e3.1.1	***h5 Aw-Pl/buffalo-berry***		
		e3.2 Aw-Sw-Pl/alder	***h6 Aw-Pl/alder***		
		e3.2.1	***h7 Aw-Pb-Sw/alder***		
		e3.3 Aw-Sw-Pl/low-bush cranberry	***h8 Pl-Aw/forb/marsh reedgrass***		
		e3.4 Aw-Sw-Pl/rose	***h9 Aw-Sw/rose/forb***	il Aw-Sw/clover	
		e3.4.1	***h10 Pl-Sw-Aw/rose/hairy wild rye***		
		e3.4.2	***h11 Aw-Pl-Sw/snowberry***		
		e3.5 Aw-Sw-Pl/feathermoss	***j10 Pl-Sw/twinflower/moss***		
		e3.6			l8 Aw/willow/purple oatgrass dwarf bilberry
	e4 low-bush cranberry Sw	e4.1 Sw/green alder			
		e4.1.1	***jll Sw/buffalo-berry***		

Ecosite	Ecosite Phase	Plant Community Type	*Range Plant Community Type*	*Grazing Succession*	*Harvesting Succession*
		e4.2 Sw/low-bush cranberry			
		e4.3 Sw/prickly rose		k2 Sw/clover	
		e4.4 Sw/fir/feathermoss			
		e4.5 Sw/feathermoss	***j12 Sw/moss***		19 moss/marsh reedgrass
	e5 shrubland	e5.1	***c2 snowberry-saskatoon***		
		e5.2	***c3 hazelnut/wild sarsaparilla***		
		e5.3		d3 alder/creeping red fescue/clover	
f Bracted honeysuckle Subhygric/rich	f1 bracted honeysuckle/ fern Pl	f1.1 pl/bracted honeysuckle/ fern			
		f1.2 Pl/green alder/fern			
		f1.3 Pl/fir/fern			
		f1.4 Pl/devil's-club/fern			
		f1.5 Pl/fern/feathermoss			
	f2 bracted honeysuckle/ fern Aw-Pb	f2.1 Aw-Pb/bracted honeysuckle/fern	***f1 Aw-Bw-Pb/bracted honeysuckle/oakfern***		

Ecosite	Ecosite Phase	Plant Community Type	*Range Plant Community Type*	*Grazing Succession*	*Harvesting Succession*
		f2.1.1	***e12 Aw/bracted honeysuckle***		l10 Aw/bracted honeysuckle/horsetail
		f2.1.2	***f2 Pb-Aw/beaked hazelnut***		
		f2.1.3	***f3 Aw-Pb/marsh reedgrass***		
		f2.1.4	***f4 Aw-Pb-Bw/rose/marsh reedgrass***		l11 marsh reedgrass/Pb/ wild raspberry/fireweed
		f2.1.5	***f5 Pb/snowberry***		
		f2.2 Aw-Pb/green alder-river alder/fern	***f6 Aw-Pb/green alder/marsh reedgrass***		l12 Pb/green alder/marsh reedgrass
		f2.2.1	***f7 Aw-Pb/alder-honeysuckle***		
		f2.2.2	***f8 Aw-Bw/alder-honeysuckle***		
		f2.2.3	***f9 Aw-Pb/river alder***		
		f2.3 Aw-Pb/dogwood/fern	***f10 Aw-Pb/dogwood***		
		f2.3.1	***f11 Aw-Pb/cowparsnip***		
		f2.3.2	***e13 Aw/thimbleberry***		
		f2.3.3	***e14 Aw/oak fern***		

Ecosite	Ecosite Phase	Plant Community Type	*Range Plant Community Type*	*Grazing Succession*	*Harvesting Succession*
		f2.3.4	***e15 Aw/willow***		
		f2.3.5			l13 marsh reedgrass/Bw-Aw/willow
		f2.4 Aw-Pb/devil's-club/fern	***f13 Pb-Aw/devil's-club***		
	f3 bracted honeysuckle/ fern Aw-Sw-Pl	f3.1 Aw-Sw-Pl/bracted honeysuckle/fern	***h12 Aw-Sw-Pb/bracted honeysuckle***		
		f3.2 Aw-Sw-Pl/green alder/fern			l14 fireweed/green alder/Pl-Sw
		f3.3 Aw-Sw-Pl/ dogwood/fern			
		f3.4 Aw-Sw-Pl/fir/fern			
		f3.5 Aw-Sw-Pl/devil's-club/fern	***j13 Se-Pl/cow parsnip***		
		f3.6 Aw-Sw-Pl/fern/ feathermoss			
	f4 bracted honeysuckle/ fern Sw	f4.1 Sw/bracted honeysuckle/fern	***j14 Sw/willow-honeysuckle***		l15 Sw/willow/marsh reedgrass
		f4.2 Sw/green alder-river alder/fern	***j15 Sw/alder***		

Ecosite	**Ecosite Phase**	**Plant Community Type**	***Range Plant Community Type***	***Grazing Succession***	***Harvesting Succession***
		f4.3 Sw/fir/fern			
		f4.4 Sw/deveil's-club/ern			
		f4.5 Sw/fern/feathermoss			
	f5 shrublands	f5.1	***c4 willow-bog birch/graceful sedge***	d4 hazelnut/ cowparsnip/kentucky blugrass	
g meadow (subhygric/very rich)	g1 shrubby meadow	g1.1 willow meadow	***c5 willow/slender wheatgrass-fringed brome***	d5 willow/ kentucky bluegrass/clover	
		g1.2	***c6 willow/marsh reedgrass***		
	g2 forb meadow	g2.1 cow parsnip meadow	***b4 cow parsnip/veiny meadow rue***	d1 kentucky bluegrass-timothy/veiny meadow rue	
	g3 graminoid meadow	***g3.1***	***b5 tufted hairgras-slender wheatgrass/veiny meadow rue***		
		g3.2	***b6 sedge/veiny meadow rue***	d2 sedge-kentucky bluegrass/veiny meadow rue	

Ecosite	Ecosite Phase	Plant Community Type	*Range Plant Community Type*	*Grazing Succession*	*Harvesting Succession*
h labrador tea - subhygric (subhygric/ poor)	h1 labrador tea - subhygric - Sb-Pl	h1.1 Sb-Pl/labrador tea/feathermoss			
		h1.2 Sb-Pl/alder/feathermoss			
		h1.3 Sb-Pl/feathermoss	***j16 Sb-Pl/moss***		l16 Pl-Sb/labrador tea/horsetail/moss
i horsetail (hygric/rich)	i1 horsetail Pb-Aw	i1.1 Pb-Aw/horsetail	***e16 Aw/rose/horsetail***		
		i1.1.1	***f13 Pb/willow/horsetail***		
	i2 horsetail Pb-Sw	12.1 Pb-Sw/horsetail			
	i3 horsetail Sw	i3 Sw/horsetail (/stair-step moss)	***j17 Sw/horsetail/moss***		
		13.2 Sw/feathermoss (Sw/stair-step moss)			
	i4 shrubland	***i4.1***	***c7 alder/marsh reed grass***		
		i4.2	***c8 willow/horsetail***		
		i4.3	***c9 willow-alder/fern***		
j labrador tea/horsetail hygric/medium	j1 labrador tea/horsetail Sb-Sw	j1.1 Sb-Sw/labrador tea/horsetail	***j18 sb/labrador tea/horsetail/moss***		

Ecosite	**Ecosite Phase**	**Plant Community Type**	***Range Plant Community Type***	***Grazing Succession***	***Harvesting Succession***
		j1.2 Sw-Sb/feathermoss			l17 willow/hair-like sedge/Sw
		j1.3 Sb/horsetail/ feathermoss			
k dog subhydric/poor	k1 treed bog	k1.1 Sb/labrador tea/ cloudberry/peat moss	***j19 Sb/labrador tea-bogcranberry/ cloudberry***		
	k2 shrubby bog	k2.1 labrador tea/cloudberry/peat moss			
l poor fen subhydric/medium	l1 treed poor fen	l1.1 Sb-Lt/dwarf birch/sedge/peat moss	***j20 Sb-Lt/sedge/moss***		
	l2 shrubby poor fen	l2.1 dwarf birch-willow/sedge/peat moss	***c11 dwarf birch-willow/sedge/peatmoss***		
m rich fen subhydric/rich	m1 treed rich fen	m1.1 Lt/dwarf birch/sedge/golden moss	***j21 Lt/bog birch/sedge/moss***		
	m2 shrubby rich fen	m2.1 dwarf birch/sedge/golden moss	***c10 willow-bog birch/water sedge***		
		m2.2 willow/sedge/golden moss			

Ecosite	Ecosite Phase	Plant Community Type	*Range Plant Community Type*	*Grazing Succession*	*Harvesting Succession*
	m3 graminoild rich fen	m3.1 sedge rich fen	***b7 marsh reed grass slough***		
		m3.2 sedge/brown moss	***b8 water edge meadow***		
n marsh hydric/rich	n1 marsh	n1.1 cattail marsh			
		n1.2 bulrush marsh			

Table 1b: Tame grassland range plant community types linked with the associated ecosite and ecosite phase adapted from Beckingham et al. 1996.

Ecosite	Ecosite phase	Plant community type	Range plant community type
e low-bush cranberry (mesic/medium)	e2 low-bush crandberry Aw	*e2.4.1*	a1 creeping red fescue-timothy/clover
		e2.4.2	a2 timothy-kentucky bluegrass/clover
		e2.4.3	a3 creeping red fescue-orchardgrass/clover
		e2.4.4	a4 creeping red fescue/slenderwheatgrass/clover
		e2.4.5	a5 smooth brome/clover
		e2.4.6	a6 marsh reedgrass/rose/strawberry-dandelion
		e2.4.7	a7 hairy wild rye/clover
		e2.4.8	a8 kentucky bluegrass/clover-dandelion
		e2.4.9	a9 kentucky bluegrass-timothy/caraway
		e2.4.10	a10 kentucky bluegrass-timothy/tall buttercup

		e2.4.11	a11 kentucky bluegrass-mountain ricegrass-sedge
f braced honeysuckle (subhygric/rich)	f2 bracted honeysuckle/fern Aw-Pb	*f2.4.5*	a12 reed canary grass-creeping red fescue/red clover
		f2.4.6	a13 meadow foxtail-creeping red fescue/alsike clover
m rich fen (subhydric/rich)	m3 graminoid rich fen	*m3.1.1*	a14 reed canary grass/water parsnip
		m3.1.2	a15 sedge-timothy/horsetail

Table 2. Ecosite forage production summary of the Lower Foothills subregion

Ecosite	Total Production (kg/ha)	Suggested Stocking Rate (ha/AUM)	Sample size (n)
a grassland (subxeric/poor)	297	0.0	5
b bearberry/lichen (submesic/poor)	712	2.6	1
c hairy wild rye (submesic/medium)	749	2.4	37
d labrador tea - mesic (mesic/poor)	721	2.5	21
e low bush-cranberry (mesic/medium)	1030	1.8	322
f bracted honeysuckle (subhygric/rich)	1315	1.4	149
g meadow (subhygric/very rich)	2264	0.4	23
h labrador tea - subhygric (subhygric/poor)	n/a	0.0	0
i horsetail (hygric/rich)	1070	1.7	9
j labrador tea/horsetail (hygric/medium)	n/a	0.0	0
k bog (subhydric/poor)	1144	0.0	2
l poor fen (subhydric/medium)	757	0.0	8
m rich fen (subhydric/rich)	2766	0.0	7
n marsh (hydric/rich)	n/a	0.0	0

Table 3. Ecosite phase forage production summary for the Lower Foothills subregion				
Ecosite	Ecosite phase	Total production (kg/ha)	sample size (n)	Suggested Grazing capacity (ha/AUM)
a bearberry grassland xeric/poor	a1 shrubby grassland	297	5	non-use
b bearberry lichen subxeric/poor	b1 bearberry Aw-Sw-Pl	712	1	2.6
c hairy wild rye submesic/medium	c1 hairy wild rye Pl	495	12	3.7
	c1_harvest Pl	886	2	3.7
	c2 hairy wild rye Aw	960	7	1.9
	c2_grazed Aw	374	2	4.8
	c3 hairy wild rye Aw-Sw-Pl	558	2	3.3
	c3_harvest Aw-Sw-Pl	2129	2	3.3
	c4 hairy wild rye Sw	468	5	3.9
	c4_harvest Sw	1419	2	3.9
	c5 shrubland	1252	1	1.5
	c6 grassland	652	1	1.4
d labrador tea - mesic mesic/poor	d1 labrador tea - mesic Pl-Sb	n/a	0	non-use
	d2 labrador tea - mesic Pl	888	7	2.1
	d3 labrador tea - mesic Aw-Sw-Pl	637	14	2.9

e low-bush cranberry mesic/medium	e1 low bush cranberry Pl	610	1	3.0
	e1_grazed Pl	1344	1	1.4
	e1_harvest Pl	1084	9	3.0
	e1_harvest_grazed Pl	2210	3	3.0
	e2 low bush cranberry Aw	917	116	2.0
	e2_grazed Aw	944	75	2.0
	e2_harvest Aw	2084	16	2.0
	e2_harvest_grazed Aw	1418	9	2.0
	e3 low bush cranberry Aw-Sw-Pl	750	69	2.4
	e3_grazed Aw-Sw-Pl	496	2	3.7
	e3_harvest Aw-Sw-Pl	1756	1	2.4
	e3_harvest_grazed Aw-Sw-Pl	4070	1	2.4
	e4 low bush cranberry Sw	489	13	3.7
	e4_grazed Sw	778	1	2.3
	e4_harvest Sw	1755	4	3.7
	e5 low bush cranberry shrubland	1776	3	1.5
	e5_grazed shrubland	3466	1	0.3

f bracted honeysuckle subhygric/rich	f1 bracted honeysuckle Pl	900*	0	2.0
	f2 bracted honeysuckle Aw-Pb	1244	138	1.5
	f2_harvest Aw-Pb	4008	3	1.5
	f3 bracted honeysuckle Aw-Sw-Pl	2014	1	0.9
	f3_harvest Aw-Sw-Pl	2610	2	2.0
	f4 bracted honeysuckle Sw	592	3	3.1
	f4_harvest Sw	1608	1	3.1
	f5 shrubland	1885	6	1.0
	f5_grazed shrubland	1676	1	1.1
g meadow subhygric/very rich	g1 shrubby meadow	2798	8	0.4
	g1_grazed shrubby meadow	2165	4	0.4
	g2 forb meadow	2100	1	0.4
	g2_grazed forb meadow	2846	1	0.4
	g3 graminoid meadow	2803	2	0.4
	g3_grazed graminoid meadow	2615	2	0.4
h labrador tea subhgyric subhygric/poor	h1 labrador tea - subhygric Sb-Pl	n/a	0	non-use
	h1_harvest Sb-Pl	n/a	0	non-use

i horsetail hygric/rich	i1 horsetail Pb-Aw	1260	6	1.4
	i3 horsetail Sw	n/a	0	non-use
	i4 shrubland	1671	4	1.2
j labrador tea/horsetail hygric/medium	j1 labrador tea/horsetail Sb-Sw	n/a	0	non-use
	j1_harvest Sb-Sw	n/a	0	non-use
k bog subhydric/poor	k1 treed bog	1144	2	non-use
	k2 shrubby bog	n/a	0	non-use
l poor fen subhydric/medium	l1 treed poor fen	757	9	non-use
	l2 shrubby poor fen	n/a	0	non-use
m rich fen subhydric/rich	m1 treed rich fen	1755	3	non-use
	m2 shrubby rich fen	3048	5	non-use
	m3 graminoid rich fen	2061	2	non-use
n marsh hydric/rich	n1 marsh	n/a	0	non-use

TAME PASTURE COMMUNITY TYPES

OF THE

LOWER FOOTHILLS SUBREGION

Photo 1: Typical Range improvement clearing seeded to creeping red fescue, timothy and alsike clover in the Lower Foothills subregion

TAME FORAGE COMMUNITIES

(Cleared areas that have been broken and seeded to tame forage)

Throughout the Lower Foothills subregion there are sites that have been deforested, broken, and seeded to tame forage. Usually these areas are mesic and moderately well to well drained with good nutrient levels. Because most of these tame forage stands are established on similar sites, the most influential factors affecting plant species composition are stand establishment and grazing regime (photo 2).

Stand establishment is important because it determines what the initial plant species composition is going to be. Seed bed preparation and the type of seed sown are the two most important factors influencing stand establishment. Seed bed preparation is important because it helps to determine how well the sown seed germinates and establishes. If the seed bed is not well prepared the tame forage stand may establish poorly and native species can become a dominant component of the plant community. If the seed bed is well prepared, the community type that establishes will depend on the type of seed sown. If a mixture of creeping red fescue, timothy, and alsike clover is sown into the area a Creeping Red Fescue/ Alsike Clover community type will become established (photo 3). Whereas, if a mixture of smooth brome, timothy, creeping red fescue, and red clover is sown, a Smooth Brome/ Red Clover community type will become established.

After the stand is established, the grazing regime applied to the stand will determine the plant species composition. Generally, a light to moderate amount of grazing allows the stand to maintain itself while sustained heavy grazing causes the stand to degrade. Damage to a stand due to over grazing occurs more readily while the stand is establishing than it does when the stand is established. This is because the forage plants in an establishing stand have not had time to develop energy reserves in their roots, and are therefore, more susceptible to grazing induced damage.

Well distributed light to moderate grazing will normally maintain a forage stand similar to what was seeded on the site. These stands are generally the most productive and provide the best grazing opportunities for livestock. They are normally considered to be in good to excellent range condition. Non use or very light grazing often results in the stand becoming dominated by the forage species that is most competitive under an ungrazed situation. Plant community changes which occur under heavy grazing are dependent on the grazing history (level of use, season of use and duration of the grazing regime). Overgrazed community types develop over a long period of repeated overgrazing. If weedy species such as tall buttercup, become established on overgrazed sites, they can quickly become a dominant species (Photo 4).

Photo 5 illustrates the effects of seed establishment and grazing regime on a site's productivity.

TAME PASTURE COMMUNITY TYPES

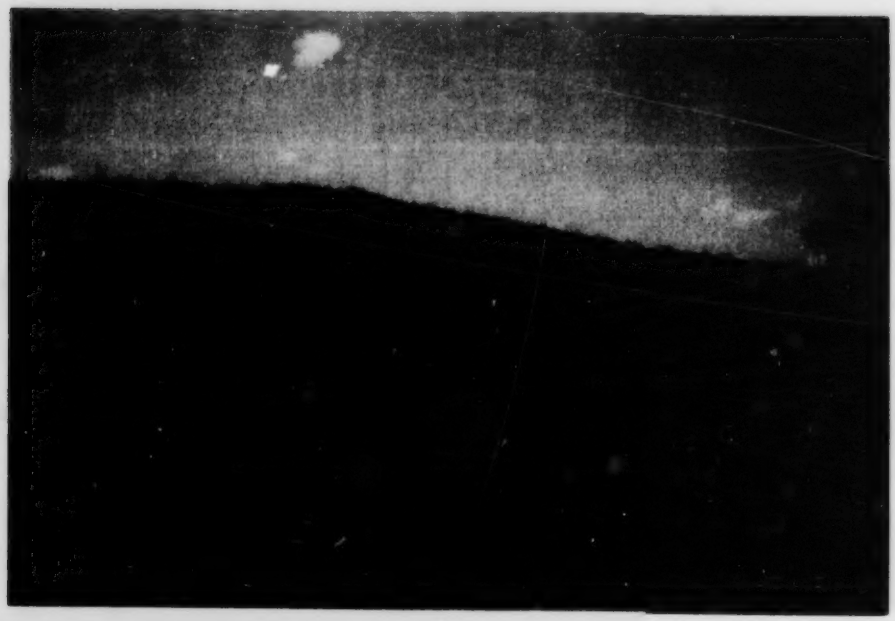


Photo 2: A moderately grazed range improvement clearing in fair to good condition. Rose is starting to invade from adjacent aspen forest as a result of the grazing pressure.

Photo 3: A recently cleared range improvement site seeded to timothy, creeping red fescue, and clover. This community is in excellent condition.

Photo 4: Tall buttercup, a noxious weed, has invaded into a heavily-grazed Kentucky bluegrass/ Clover-Dandelion community. Tall buttercup is a poisonous weed which invades onto moist sites that have exposed or disturbed soils.

Photo 5: Poor seed establishment of creeping red fescue combined with heavy grazing pressure has resulted in low productivity and an abundance of exposed soil. These are prime conditions for invasion by weeds.

Table 4. Forage production summary for tame pasture community types of the Lower Foothills Subregion.				
Ecosite	Community Type	Total Forage Production (kg/ha)	Sample size (n)	Suggested Grazing (ha/AUM)
e low-bush cranberry mesic/medium		**3398**	**175**	**0.3**
	a1 creeping red fescue-timothy/clover	3427	104	0.3
	a2 timothy-kentucky bluegrass/clover	4360	10	0.2
	a3 creeping red fescue-orchardgrass/ clover	4161	1	0.2
	a4 creeping red fescue/slender wheatgrass/clover	2809	2	0.3
	a5 smooth brome/clover	3623	2	0.3
	a6 marsh reed grass/ rose/strawberry-dandelion	1936	5	0.5
	a7 hairy wild rye/ clover	1228	1	0.7
	a8 kentucky bluegrass/ clover- dandelion	3389	43	0.3
	a9 kentucky bluegrass -timothy/caraway	1794	2	0.5
	a10 kentucky bluegrass-timothy/ tall buttercup	4694	3	0.2
	a11 kentucky bluegrass- mountain ricegrass-sedge	1695	2	0.5
f bracted honeysuckle subhygric/ rich		**2990**	**6**	**0.3**
	a12 reed canary grass - creeping red fescue/ red clover	3312	2	0.3
	a13 meadow foxtail - creeping red fescue/ alsike clover	2829	4	0.3
m rich fen subhydric/ rich		**4246**	**3**	**0.2**
	a14 reed canary grass/ water parsnip	6737	1	0.2
	a15 sedge-timothy/ horsetail	3000	2	0.2
Average production		**3399 (88-7756)**	**184**	**0.3**

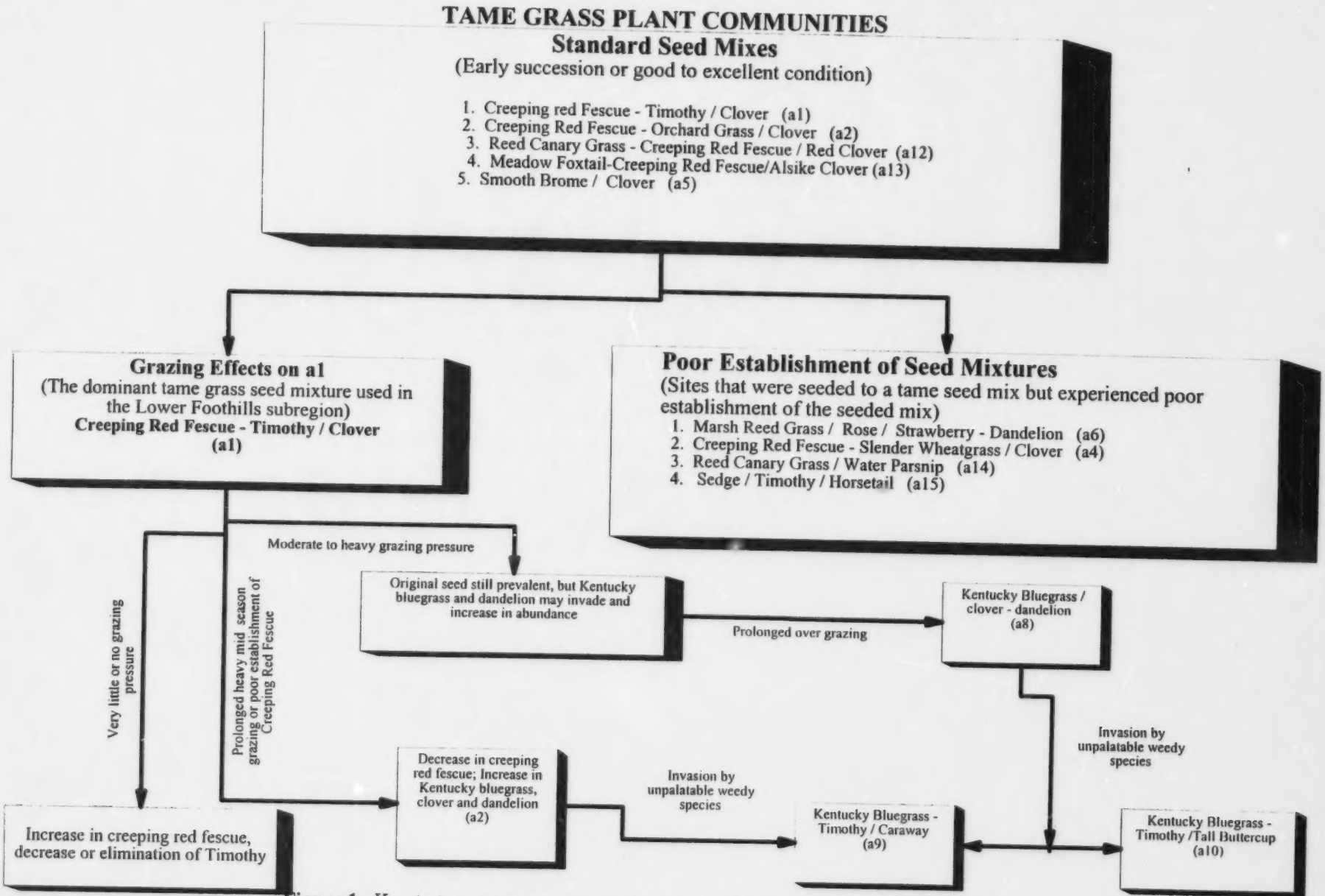

TAME GRASS PLANT COMMUNITIES
Standard Seed Mixes
(Early succession or good to excellent condition)
1. Creeping red Fescue - Timothy / Clover (a1)
2. Creeping Red Fescue - Orchard Grass / Clover (a2)
3. Reed Canary Grass - Creeping Red Fescue / Red Clover (a12)
4. Meadow Foxtail-Creeping Red Fescue/Alsike Clover (a13)
5. Smooth Brome / Clover (a5)
Grazing Effects on a1
(The dominant tame grass seed mixture used in the Lower Foothills subregion)
Creeping Red Fescue - Timothy / Clover
(a1)
Poor Establishment of Seed Mixtures
(Sites that were seeded to a tame seed mix but experienced poor establishment of the seeded mix)
1. Marsh Reed Grass / Rose / Strawberry - Dandelion (a6)
2. Creeping Red Fescue - Slender Wheatgrass / Clover (a4)
3. Reed Canary Grass / Water Parsnip (a14)
4. Sedge / Timothy / Horsetail (a15)
Moderate to heavy grazing pressure
Very little or no grazing pressure
Prolonged heavy mid season grazing or poor establishment of Creeping Red Fescue
Original seed still prevalent, but Kentucky bluegrass and dandelion may invade and increase in abundance
Prolonged over grazing
Kentucky Bluegrass / clover - dandelion (a8)
Invasion by unpalatable weedy species
Increase in creeping red fescue, decrease or elimination of Timothy
Decrease in creeping red fescue; Increase in Kentucky bluegrass, clover and dandelion (a2)
Invasion by unpalatable weedy species
Kentucky Bluegrass - Timothy / Caraway (a9)
Kentucky Bluegrass - Timothy /Tall Buttercup (a10)

Figure 1. Key to tame pasture community types within the Lower Foothills subregion

a1: Creeping red fescue -Timothy/ Clover

(Festuca rubra-Phleum pratense/ Trifolium spp.)

n=130 This community type occurs on cleared pastures that were seeded with a creeping red fescue - timothy / clover mixture. Variations in grazing management will cause shifts in the relative cover of the main species. With low -intensity grazing or non-use, the relative cover will shift to mainly creeping red fescue and clover, or possibly to a near monoculture of creeping red fescue. Low grazing pressure allows creeping red fescue to spread throughout the site by creeping rhizomes and choke out Timothy by forming a dense matt of litter. A heavy grazing regime promotes an increase in Kentucky bluegrass and dandelion. If this heavy grazing occurs early in the spring, Kentucky bluegrass may replace timothy. Timothy is an early season grass with an upright growth form which is preferentially grazed in the early spring. A moderate grazing regime will maintain the original species mix of creeping red fescue, timothy and clover.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
N/A			
SHRUBS			
N/A			
FORBS			
CLOVER *(Trifolium spp.)*	21	0-56	92
DANDELION *(Taraxacum officinale)*	15	0-44	94
STRAWBERRY *(Fragaria virginiana)*	2	0-16	76
GRASSES			
CREEPING RED FESCUE *(Festuca rubra)*	32	1-92	100
TIMOTHY *(Phleum pratense)*	12	0-61	95
KENTUCKY BLUEGRASS *(Poa pratensis)*	16	0-68	91

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC
NUTRIENT REGIME:
MESOTROPHIC TO PERMESOTROPHIC
SOIL DRAINAGE:
IMPERFECTLY TO WELL
ELEVATION (MEAN):
701 - 1249(1091) M
SLOPE: 1-20%

FORAGE PRODUCTION (KG/HA) N=104

GRASS	2862 (66-7020)
FORBS	557 (4-4048)
SHRUBS	13 (0-344)
TOTAL	3427 (88-7756)

SUGGESTED GRAZING
0.3 HA/AUM

a2: Timothy- Kentucky bluegrass / Clover

(Phleum pratense- Poa pratensis / Trifolium spp.)

n=13 This community type seems to have developed from either poor establishment of creeping red fescue into a new pasture or prolonged heavy mid-season grazing. Timothy is an early season grass with an upright growth form which quickly becomes unpalatable if not grazed early enough. Consequently, other grasses (eg. creeping red fescue) become preferrentially over-grazed during the mid-season as a result. Creeping red fescue is most susceptible to heavy grazing in the mid-season because it is just starting to green up and is therefore very palatable. This community type is usually considered to be in fair condition.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
N/A			
SHRUBS			
N/A			
FORBS			
CLOVER *(Trifolium spp.)*	31	0-46	92
DANDELION *(Taraxacum officinale)*	10	0-30	92
WILD STRAWBERRY *(Fragaria virginiana)*	5	0-21	77
GRASSES			
TIMOTHY *(Phleum pratense)*	40	6-70	100
KENTUCKY BLUEGRASS *(Poa pratensis)*	18	0-56	85
CREEPING RED FESCUE *(Festuca rubra)*	3	0-9	46

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC
NUTRIENT REGIME:
MESOTROPHIC TO PERMESOTROPHIC
SOIL DRAINAGE:
MODERATELY WELL
ELEVATION (MEAN):
853 - 1570(1037) M
SLOPE : 0 - 20 %

FORAGE PRODUCTION (KG/HA) N=10

GRASS	3433 (188-6288)
FORBS	914 (66-3664)
SHRUBS	13 (0-74)
TOTAL	4360 (388-6633)

SUGGESTED GRAZING
0.2 HA/AUM

a3: Creeping red fescue - Orchardgrass / Clover

(Festuca rubra / Dactylis glomerata / Trifolium spp.)

n=2 This community type occurs on cleared pastures that were seeded with a creeping red fescue - orchard grass / clover or a creeping red fescue - orchard grass / timothy / clover mix. This community type provides a productive high quality stand of forage. In recent years, orchard grass has become more popular as a forage species to be seeded on range improvements because of its quick establishment, high productivity and its ability to regrow relatively quickly after grazing.

PLANT COMPOSITION

	CANOPY COVER(%) MEAN	RANGE	CONST.
TREES			
N/A			
SHRUBS			
N/A			
FORBS			
CLOVER *(Trifolium spp.)*	22	21-22	100
DANDELION *(Taraxacum officinale)*	5	1-8	100
LINDLEY'S ASTER *(Aster ciliolatus)*	4	0-8	50
GRASSES			
CREEPING RED FESCUE *(Festuca rubra)*	31	0-61	100
ORCHARD GRASS *(Dactylis glomerata)*	18	13-23	100
TIMOTHY *(Phleum pratense)*	10	0-20	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC
NUTRIENT REGIME:
MESOTROPHIC TO PERMESOTROPHIC
SOIL DRAINAGE:
WELL
ELEVATION (MEAN):
838 - 1143(991) M
SLOPE : VARIABLE

FORAGE PRODUCTION (KG/HA) N=1

GRASS	3771
FORBS	390
SHRUBS	0
TOTAL	4161

SUGGESTED GRAZING
0.2 HA/AUM

a4: Creeping red fescue - Slender wheatgrass / Clover

(Festuca rubra / Agropyron trachycaulum / Trifolium spp.)

n=2 This community type occurs on cleared pastures that were seeded with a creeping red fescue - timothy / clover seed mix. However, because of poor seedbed preperation and poor establishment of the seed mixture (possibly due also to the drier site conditions), slender wheatgrass has invaded onto the site.

PLANT COMPOSITION

	CANOPY COVER(%) MEAN	RANGE	CONST.
TREES			
N/A			
SHRUBS			
N/A			
FORBS			
CLOVER *(Trifolium spp.)*	38	32-43	100
DANDELION *(Taraxacum officinale)*	11	3-18	100
STRAWBERRY *(Fragaria virginiana)*	1	0-1	100
GRASSES			
CREEPING RED FESCUE *(Festuca rubra)*	20	18-22	100
SLENDER WHEATGRASS *(Agropyron trachycaulum)*	10	9-11	100
TIMOTHY *(Phleum pratense)*	4	1-5	100
KENTUCKY BLUEGRASS *(Poa pratensis)*	3	1-3	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBMESIC
NUTRIENT REGIME:
MESOTROPHIC
SOIL DRAINAGE:
WELL
ELEVATION (MEAN):
940 - 970 (955) M
SLOPE: 0 - 7%

FORAGE PRODUCTION (KG/HA) N=2

GRASS	2508 (2411-2605)
FORBS	301 (152-450)
SHRUBS	0
TOTAL	2809 (2757-2861)

SUGGESTED GRAZING
0.3 HA/AUM

a5: Smooth Brome/ Clover

(Bromus inermis/Trifolium spp.)

n=2 This community type has formed under a moderate grazing regime from a seed mixture of smooth brome grass, creeping red fescue, timothy and red clover. It is considered to be in good to excellent condition. With a moderate grazing regime, smooth brome grass is the most competitive forage plant seeded into this site. It out-competes timothy because it is strongly rhizomatous and is able to fill in the gaps between plants allowing it to shade out the timothy reducing its prominence in the stand. Smooth brome grass out-competes creeping red fescue becuse it establishes faster. Fast establishment enables smooth brome to quickly become dominant and shade out slower establishing species.

Quack grass has invaded into this site (probably from contaminated seed) and may become co-dominant or dominant in this stand depending on future grazing intensities.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
N/A			
SHRUBS			
N/A			
FORBS			
DANDELION *(Taraxacum officinale)*	18	8-28	100
CLOVER *(Trifolium spp.)*	11	1-20	100
GRASSES			
SMOOTH BROME GRASS *(Bromus inermis)*	23	10-36	100
KENTUCKY BLUEGRASS *(Poa Pratensis)*	12	3-20	100
SLENDER WHEATGRASS *(Agropyron trachycaulum)*	10	0-20	50
CREEPING RED FESCUE *(Festuca Rubra)*	6	0-11	50
QUACKGRASS *(Agropyron repens)*	5	0-9	50
TIMOTHY *(Phleum pratense)*	3	0-6	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC
NUTRIENT REGIME:
MESOTROPHIC TO PERMESOTROPHIC
SOIL DRAINAGE:
MODERATELY WELL TO WELL
ELEVATION (MEAN):
853 - 900 (877) M

FORAGE PRODUCTION (KG/HA) N=2

GRASS	2848 (1910-3786)
FORBS	725 (522-928)
SHRUBS	0
TOTAL	3623 (2938-4308)

SUGGESTED GRAZING
0.3 HA/AUM

a6: Marsh Reed Grass/ Rose/ Strawberry - Dandelion

(Calamagrostis canadensis/ Rosa acicularis/ Fragaria virginiana -Taraxacum officinale)

n=8 This community type appears to be in an early to mid-successional stage. It occurs on clear-cuts that were harvested within the past one or two years, on range improvements that had poor seed establishment on range improvement sites that have received low grazing intensities, and on pipelines that were not seeded or had poor seed establishment. This community type appears to be associated with a low stocking rate and an affinity to succeed towards aspen and coniferous forest.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
N/A			
SHRUBS			
ROSE			
(Rosa acicularis)	6	0-12	88
RASPBERRY			
(Rubus idaeus)	2	0-5	75
FORBS			
STRAWBERRY			
(Fragaria virginiana)	6	1-17	100
DANDELION			
(Taraxacum officinale)	4	0-10	100
LINDLEY'S ASTER			
(Aster ciliolatus)	4	0-9	100
FIREWEED			
(Epilobium angustifolium)	5	0-15	88
CLOVER			
(Trifolium spp.)	10	0-49	88
GRASSES			
MARSH REED GRASS			
(Calamagrostis canadensis)	20	7-41	100
TIMOTHY			
(Phleum pratense)	8	0-33	88
UPLAND SEDGE			
(Carex obtusata)	3	0-9	75

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC TO SUBHYGRIC
NUTRIENT REGIME:
MESOTROPHIC TO PERMESOTROPHIC
SOIL DRAINAGE:
MODERATELY WELL
ELEVATION (MEAN):
823 -1219 (997)M
SLOPE:
0 - 6%
ASPECT: NORTHERLY

FORAGE PRODUCTION (KG/HA) N=5

GRASS	1034 (68-1730)
FORBS	771 (438-1200)
SHRUBS	131 (0-340)
TOTAL	1936 (602-2710)

SUGGESTED GRAZING
0.5 HA/AUM

a7: Hairy wild rye / Clover

(Elymus innovatus / Trifolium spp.)

n=1 This pasture community type has been modified from the orginal seeded mixture. After the oringinal seeding (Creeping Red Fescue - Timothy - Clover) the pasture was grazed for 5-7 years and cultivated. Hairy Wild Rye invaded the site following cultivation, likely from the adjacent Aw/blueberry/Hairy wild rye stands.

PLANT COMPOSITION

	CANOPY COVER(%) MEAN	RANGE	CONST.
TREES		-	
N/A			
SHRUBS			
N/A			
FORBS			
CLOVER *(Trifolium spp.)*	15	-	100
STRAWBERRY *(Fragaria virginiana)*	7	-	100
DANDELION *(Taraxacum officinale)*	2	-	100
LINDLEY'S ASTER *(Aster ciliolatus)*	2	-	100
GRASSES			
HAIRY WILD RYE *(Elymus innovatus)*	33	-	100
SEDGE *(Carex spp.)*	4	-	100
PURPLE OATGRASS *(Schizachne purpurascens)*	3	-	100
KENTUCKY BLUEGRASS *(Poa pratensis)*	3	-	100
TIMOTHY *(Phleum pratense)*	3	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC
NUTRIENT REGIME:
MESOTROPHIC
SOIL DRAINAGE:
WELL
ELEVATION: 950 M
SLOPE: 1%
ASPECT: SOUTHERLY

FORAGE PRODUCTION (KG/HA) N=1

GRASS	1104
FORBS	124
SHRUBS	0
TOTAL	1228

SUGGESTED GRAZING
0.7 HA/AUM

a8: Kentucky Bluegrass/ Clover - Dandelion

(Poa pratensis/ Trifolium repens or hybridum - Taraxacum officinale)

n=67 This community type has had a history of being grazed heavily throughout the growing season. Heavy grazing throughout the growing season, allows kentucky bluegrass, clover, and dandelion to out-compete all of the other vegetation. This community occurs on tame pastures or native rangeland that have been over grazed. Generally, forage production is usually degraded on these over-grazed pastures with forage production 30-50% lower that good condition pastures (Smith et al 1995). This community type is considered to be in poor condition.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
N/A			
SHRUBS			
N/A			
FORBS			
CLOVER			
(Trifolium spp.)	30	0-73	96
DANDELION			
(Taraxacum officinale)	18	0-56	100
COMMON YARROW			
(Achillea millefolium)	2	0-23	70
STRAWBERRY			
(Fragaria virginiana)	2	0-17	100
GRASSES			
KENTUCKY BLUEGRASS			
(Poa pratensis)	37	0-84	97
TIMOTHY			
(Phleum pratense)	7	0-40	89
CREEPING RED FESCUE			
(Festuca rubra)	5	0-45	48

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC
NUTRIENT REGIME:
MESOTROPHIC TO PERMESOTROPHIC
SOIL DRAINAGE:
MODERATELY WELL TO WELL
ELEVATION (MEAN):
788 -1572 (1052)M
SLOPE: 0 - 25%
ASPECT: VARIABLE

FORAGE PRODUCTION (KG/HA) N=43

GRASS	2474 (524-5370)
FORBS	908 (0-4398)
SHRUBS	6 (0-188)
TOTAL	3389 (920-7470)

SUGGESTED GRAZING
0.3 HA/AUM

a9: Kentucky Bluegrass - Timothy/ Caraway

(Poa pratensis - Phleum pratense / Carum carvi)

n=3 This community type has a history of heavy grazing and caraway has invaded into the stand. Heavy grazing favours the growth of caraway because it is not as palatable as other forbs or grasses and is therefore not grazed as intensively. Because caraway is not as heavily utilized as the other forage species it is able to flower and propagate by seed. It is also able to outcompete the species that previously inhabited the site (a Kentucky Bluegrass/ Clover - Dandelion community type). In recent years it has been noted that caraway is becoming a very invasive plant throughout Alberta. This plant should be controlled by picking any new infestations (White et al 1993).

This community type is considered to be in poor condition.

PLANT COMPOSITION

	CANOPY COVER(%) MEAN	RANGE	CONST.
TREES			
N/A			
SHRUBS			
N/A			
FORBS			
CARAWAY *(Carum carvi)*	50	21-98	100
CLOVER *(Trifolium spp.)*	18	9-35	100
DANDELION *(Taraxacum officinale)*	16	8-20	100
GRASSES			
KENTUCKY BLUEGRASS *(Poa pratensis)*	12	2-29	100
TIMOTHY *(Phleum pratense)*	9	6-10	100
CREEPING RED FESCUE *(Festuca rubra)*	12	0-21	67

ENVIRONMENTAL VARIABLES

MOISTURE- REGIME:
MESIC
NUTRIENT REGIME:
MESOTROPHIC
SOIL DRAINAGE:
WELL
ELEVATION (MEAN):
900 - 1219 (1087)M
SLOPE: 1%
ASPECT: VARIABLE

FORAGE PRODUCTION (KG/HA) N=2

GRASS	618 (398-838)
FORBS	1149 (1050-1248)
SHRUBS	27 (0-54)
TOTAL	1794 (1646-1942)

SUGGESTED GRAZING
0.5 HA/AUM

a10: Kentucky Bluegrass - Timothy/ Tall Buttercup

(Poa pratensis - Phleum pratense/ Ranuculus acris)

n=4 This community type occurs on overgrazed tame pastures that are fairly wet. The high moisture regime and over grazing has allowed tall buttercup to invade into the site. Tall buttercup is competitive in over grazed sites because it is not as palatable as the other forage plants and is therefore not grazed as intensively. Tall buttercup is also poisonous to livestock causing dermatitis and inflammation of the intestial tract (Johnston and Smoliak 1975). Ince tall buttercup receives little or no grazing pressure, it is able to propagate by producing seed and outcompete the species that previously dominated the site (a Kentucky Bluegrass/ Clover - Dandelion community type).

This community type is normally very productive because it occurs on wetter, nutrient rich sites. However, because tall butter is unpalatable this production must be discounted from the recommended stocking rate. Because of the tall buttercup this community is considered to be in poor condition.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
N/A			
SHRUBS			
N/A			
FORBS			
TALL BUTTERCUP *(Ranunculus acris)*	20	13-28	100
CLOVER *(Trifolium spp.)*	16	4-30	100
DANDELION *(Taraxacum officinale)*	9	1-15	100
GRASSES			
KENTUCKY BLUEGRASS *(Poa pratensis)*	42	23-74	100
TIMOTHY *(Phleum pratense)*	16	1-46	100
UPLAND SEDGE *(Carex spp.)*	8	6-15	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC
NUTRIENT REGIME:
MESOTROPHIC TO PERMESOTROPHIC
SOIL DRAINAGE:
MODERATELY WELL TO WELL
ELEVATION (MEAN):
838 -1219 (1047) M
SLOPE: 0 - 6 %
ASPECT: EASTERLY

FORAGE PRODUCTION (KG/HA) N=3

GRASS	4236 (2624-6978)
FORBS	458 (220-635)
SHRUBS	0
TOTAL	4694 (3259-7498)

SUGGESTED GRAZING
0.2 HA/AUM

a11: Kentucky Bluegrass -Mountain Ricegrass - Sedge

(Poa pratensis - Oryzopsis asperifolia - Carex spp.)

n=2 This pasture community type has been invaded by surrounding tree and shrub species, as well as native forbs and grasses. The initial seeding and grazing pressure did not restrict the invasion of native species onto this well drained, moderately mesic site. Upland sedge and Mountain Ricegrass have invaded and persisted. Without grazing this community type will succeed into a Aw stand dominated by saskatoon and rose. With moderate to heavy grazing kentucky bluegrass will persist and shrubs will decline.

PLANT COMPOSITION

	CANOPY COVER(%) MEAN	RANGE	CONST.
TREES			
ASPEN			
(Populus tremuloides)	2	0-2	50
SHRUBS			
SASKATOON			
(Amelanchier alnifolia)	8	0-16	100
ROSE			
(Rosa acicularis)	7	5-7	100
SNOWBERRY			
(Symphoricarpos occidentalis)	2	0-4	50
FORBS			
COMMON YARROW			
(Achillea millefolium)	9	0-18	50
NORTHERN BEDSTRAW			
(Galium boreale)	8	0-15	50
DEWBERRY			
(Rubus pubescens)	6	0-11	50
DANDELION			
(Taraxacum officinale)	5	3-6	100
GRASSES			
MOUNTAIN RICEGRASS			
(Oryzopsis asperifolia)	13	13-13	100
KENTUCKY BLUEGRASS			
(Poa pratensis)	13	0-25	50
SEDGE			
(Carex spp.)	11	7-13	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC
NUTRIENT REGIME:
MESOTROPHIC
SOIL DRAINAGE:
WELL
ELEVATION (MEAN):
697-848 (773) M
SLOPE: VARIABLE
ASPECT: SOUTHERLY

FORAGE PRODUCTION (KG/HA) N=2

GRASS	409 (92-726)
FORBS	1058 (606-1510)
SHRUBS	228 (0-456)
TOTAL	1695 (1602-1788)

SUGGESTED GRAZING
0.5 HA/AUM

a12: Reed canary grass - Creeping red fescue / Red clover

(Festuca rubra / Phalaris arundinacea / Trifolium pratense)

n=2 This community type occurs on cleared pastures that were seeded with a creeping red fescue-reed canary grass/ red clover mix. The site was fairly wet and native wetland species have started to invade into the stand. It has recently been determined that reed canary grass has invasive characteristics and seeding of this species is no longer recommended (White et al 1993).

PLANT COMPOSITION

	CANOPY COVER(%) MEAN	RANGE	CONST.
TREES			
N/A			
SHRUBS			
N/A			
FORBS			
RED CLOVER *(Trifolium pratense)*	17	0-34	50
CICER MILKVETCH *(Astragalus cicer)*	13	0-26	50
MEADOW HORSETAIL *(Equisetum pratense)*	12	0-24	50
GRASSES			
REED CANARY GRASS *(Phalaris arundinacea)*	36	17-55	100
CREEPING RED FESCUE *(Festuca rubra)*	21	11-31	100
TIMOTHY *(Phleum pratense)*	10	7-11	100
MARSH REEDGRASS *(Calamagrostis canadensis)*	4	0-8	50
KENTUCKY BLUEGRASS *(Poa pratensis)*	2	0-3	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC TO SUBHYGRIC
NUTRIENT REGIME:
PERMESOTROPHIC
SOIL DRAINAGE:
MODERATELY WELL TO WELL
ELEVATION (MEAN):
762 - 1143 (953) M
SLOPE : 3-5%

FORAGE PRODUCTION (KG/HA) N=2

GRASS	2832 (2668-2995)
FORBS	481 (11-850)
SHRUBS	0
TOTAL	3312 (2779-3845)

SUGGESTED GRAZING
0.3 HA/AUM

a13: Meadow foxtail - Creeping red fescue/ Clover

(Alopecurus pratensis - Festuca rubra/ Trifolium spp.)

n=5 This community type was formed from an area seeded to short-awned foxtail or meadow foxtail, creeping red fescue and alsike clover. Both short-awned and meadow foxtail establish and thrive well in areas with a high water table, and provide high levels of production under moderate grazing regimes. Meadow foxtail is the earliest growing domestic grass in the cooler, more moist areas of Alberta (Alberta Agriculture 1981). Therefore, it is well suited for early spring grazing.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
N/A			
SHRUBS			
N/A			
FORBS			
CLOVER *(Trifolium spp.)*	20	4-38	100
DANDELION *(Taraxacum officinale)*	11	0-34	100
GRASSES			
MEADOW FOXTAIL *(Alopecurus pratensis)*	32	0-60	80
CREEPING RED FESCUE *(Festuca rubra)*	10	0-41	40
SHORT-AWNED FOXTAIL *(Alopecurus aequalis)*	8	0-41	20
KENTUCKY BLUEGRASS *(Poa pratensis)*	6	0-13	60

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBHYGRIC
NUTRIENT REGIME:
MESOTROPHIC TO PERMESOTROPHIC
SOIL DRAINAGE:
MODERATELY WELL TO WELL
ELEVATION (MEAN):
792 - 1189 (998)M
SLOPE: VARIABLE

FORAGE PRODUCTION (KG/HA) N=4

GRASS:	2533 (2148-3042)
FORBS:	297 (26-1000)
SHRUBS:	0
TOTAL:	2829 (2200-3576)

SUGGESTED GRAZING
0.3 HA/AUM

a14: Reed Canary Grass/ Water Parsnip

(Phalaris arundinacea/ Sium suave)

n=1 This community type was found in an area that is periodically flooded in the spring. The site was also recently broken, which (along with the high moisture regime) accounts for the high productivity of the site. As this site becomes established, quack grass and clover may take over the site depending on how wet the site gets in the spring.

Recently, reed canary grass has been found to be highly invasive. Areas that have supported reed canary grass monocultures fore extended periods may have seed banks that are devoid of other species (White et al 1993). When seeding tame species, thought must be given to the compatibility of the tame species to the surrounding environment. The dominant species of this community type appears to be invasive and should probably not have been seeded.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
N/A			
SHRUBS			
N/A			
FORBS			
WATER PARSNIP *(Sium suave)*	9	-	100
WESTERN DOCK *(Rumex occidentalis)*	3	-	100
ALSIKE CLOVER *(Trifolium hybridum)*	2	-	100
DANDELION *(Taraxacum officinale)*	2	-	100
GRASSES			
REED CANARY GRASS *(Phalaris arundinacea)*	24	-	100
QUACK GRASS *(Agropyron repens)*	16	-	100
TIMOTHY *(Phleum pratense)*	14	-	100
KENTUCKY BLUEGRASS *(Poa pratensis)*	5	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC
NUTRIENT REGIME:
PERMESOTROPHIC
SOIL DRAINAGE:
MODERATELY WELL
ELEVATION: 838 M
SLOPE: 0 - 5%
ASPECT: WESTERLY

FORAGE PRODUCTION (KG/HA) N=1

GRASS	6545
FORBS	192
SHRUBS	0
TOTAL	6737

SUGGESTED GRAZING
0.1 HA/AUM

a15: Sedge - Timothy / Horsetail

(Carex spp./ Phleum pratense/ Equisetum spp.)

n=2 This community type occurs on range improvement areas or reclaimed areas that have a high water table. Because of this high water table, the creeping red fescue- timothy / clover mix that was seeded did not become well established and the site has been reinvaded by native wetland species. This community type would only be useful for livestock grazing if the water level dropped to allow easy access.

PLANT COMPOSITION

	CANOPY COVER(%) MEAN	RANGE	CONST.
TREES			
N/A			
SHRUBS			
N/A			
FORBS			
FIELD HORSETAIL *(Equisetum arvense)*	13	1-24	100
CLOVER *(Trifolium spp.)*	5	2-8	100
DANDELION *(Taraxacum officinale)*	2	0-2	100
GRASSES			
WETLAND SEDGE *(Carex spp.)*	17	6-27	100
TIMOTHY *(Phleum pratense)*	7	3-10	100
KENTUCKY BLUEGRASS *(Poa pratensis)*	3	0-5	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBHYGRIC TO HYGRIC
NUTRIENT REGIME:
PERMESOTROPHIC
SOIL DRAINAGE:
IMPERFECTLY TO MODERAELY WELL
ELEVATION (MEAN):
1067 - 1189 (1128)M
SLOPE: 0 -2%

FORAGE PRODUCTION (KG/HA) N=2

GRASS	2000
FORBS	1000
SHRUBS	0
TOTAL	3000

SUGGESTED GRAZING
0.2 HA/AUM

NATIVE GRASSLANDS

OF THE

LOWER FOOTHILLS SUBREGION

Photo 6: A typical water sedge meadow surrounded by willow shrublands. These are generally non-use for livestock due to the wet substrate, however, the drier edges where willow dominates can be used once the water table drops later in the season

NATIVE AND SHRUBLANDS GRASSLANDS

Within the Lower foothills subregion, shrublands and native grasslands are associated with lowland, seepage, riparian areas or south and west facing slopes.

The lowland sites which are routinely flooded can be arranged along a moisture gradient. Sites that are flooded for most of the year are dominated by the Wet Sedge meadows. Areas that are flooded during the spring and have the water table remain near the soil surface for the remainder of the year are invaded by willow and bog birch to form the Willow-Bog Birch/Sedge community type. Drier sites where the water table falls well below the soil surface later in the season are dominated by willow and marsh reedgrass to form the Willow/Marsh Reed Grass or the Marsh Reedgrass community types. These sites are not readily grazed, but if there are no better grazing opportunities in close proximity these sites may be heavily utilized to form Kentucky bluegrass, timothy, clover and dandelion dominated community types.

Areas that are occassionally flooded and located next to rivers and streams are typically vegetated by Cow parsnip/Veiny Meadow rue on rich sites or Sedge/Veiny meadow rue on poorer sites. In the absence of disturbance these sites can be invaded by willow or aspen to form the Willow/Slender Wheat grass- Fringed Brome shrubland or aspen dominated forest. Prolonged heavy grazing of these community types generally reduces the cover of native grass and forb species and allows Kentucky bluegrass, timothy, clover and dandelion to dominate the site.

There are a number of upland shrub dominated community types that were described in the Lower Foothills subregion. These included Alder/Marsh reedgrass and Alder/Fern communities which were found on nutrient rich, seepage areas, with east and northerly aspects. These community types are very productive, but are generally not utilized by livestock because of the thick shrub cover which limits access. On more mesic, south and west facing slopes Hazelnut/Wild sarsaparilla and Snowberry-Saskatoon communities were described. These communities are generally of fire origin and will eventually succeed to aspen dominated forest.

There were a number of grassland community types described on steep, rapidly drained south facing slopes. These included the Parry oatgrass/Bearberry and Bearberry-Juniper/Sedge dominated community types. These community types tend to occupy the steep slopes along the major rivers throughout the region. These communities tend to be too steep and unproductive for livestock use. There was one community type (California oatgrass/Bearberry) which was described in the Saddle Hills. This community appears to be related to the California oatgrass dominated communities described by Wilkinson and Johnson (1982) on solonetzic soils in the Peace River region of the province. The sequence of grass and shrubland communities in the Lower Foothills subregion is outlined in Figures 2, 3 and 4.

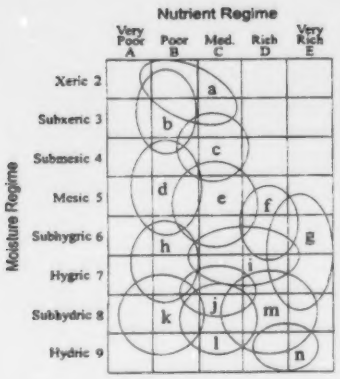
Table 5. Forage production summary for Native Grasslands of the Lower Foothills subregion

Ecosite	Community number	Community type	Productivity (kg/ha)				sample size (n)	Carrying capacity (ha/AUM)
			Grass	Forb	Shrub	Total		
a bearberry grassland subxeric/poor	**Ecosite phase**	**a1 shrubby grassland**	**65**	**130**	**101**	**297**	**5**	**non-use**
	b1	bearberry-juniper/sedge	112	252	144	507	4	1.8/non-use
	b2	bearberry/Parry's oatgrass	18	8	60	86	1	non-use
c hairy wild rye submesic/ medium	**Ecosite phase**	**c6 grassland**	**444**	**144**	**64**	**652**	**1**	**1.4**
	b3	california oatgrass/bearberry	444	144	64	652	1	1.4
g meadow subhygric/ very rich	**Ecosite phase**	**g2 forb meadow**	**1200**	**800**	**100**	**2100**	**1**	**0.4**
	b4	cowparsnip/veiny meadow rue	1200	800	100	210	1	0.4
	Ecosite phase	**g2_grazed forb meadow**	**1190**	**614**	**1042**	**2846**	**1**	**0.4**
	d1	kentucky bluegrass-timothy/veiny meadow rue	1190	614	1042	2846	1	0.4

Ecosite	Community number	Community type	Productivity (kg/ha)				sample size (n)	Carrying capacity (ha/AUM)
			Grass	Forb	Shrub	Total		
	Ecosite phase	**g3 graminoid meadow**	**1250**	**1551**	**2**	**2803**	**2**	**0.4**
	b5	tufted hairgrass-slender wheatgrass/veiny meadow rue	1355	1670	0	3025	1	0.3
	b6	sedge/veiny meadow rue	1144	1432	4	2580	1	0.4
	Ecosite phase	**g3_grazed graminoid meadow**	**1369**	**1245**	**2**	**2615**	**2**	**0.4**
	d2	sedge-kentucky bluegrass/veiny meadow rue	1369	1245	2	2615	2	0.4
m rich fen subhydric/ rich	**Ecosite phase**	**m1 graminoid rich fen**	**1755**	**0**	**98**	**1853**	**3**	**non-use**
	b7	marsh reedgrass slough	1448	0	196	1644	1	non-use
	b8	water sedge meadow	2061	0	0	2061	2	non-use

*** = estimated production.**

C6 HAIRY WILD RYE GRASSLAND N=1



CHARACTERISTIC SPECIES

Shrub

[7] prickly rose
[1] snowberry*
[4] saskatoon
[2] dwarf bilberry*

Forb [40] bearberry
[7] wild strawberry
[6] smooth aster*
[1] american vetch
[5] common yarrow*
[6] cream-colored vetchling*

Grass [3] purple oatgrass*
[21] california oatgrass
[14] carex spp.*
[3] slender wheatgrass
[2] kentucky bluegrass*
[14] hairy wild rye*

* Species characteristic of the phase but occurring in <70% of the sample plots with a prominence value <20.

SITE CHARACTERTISTICS

Moisture Regime: mesic
Nutrient Regime: medium
Topographic Position: level
Slope: (2-5)
Aspect: westerly[5], southerly[5]

PLANT COMMUNITY TYPES (N)

b2 california oatgrass/bearberry (1)

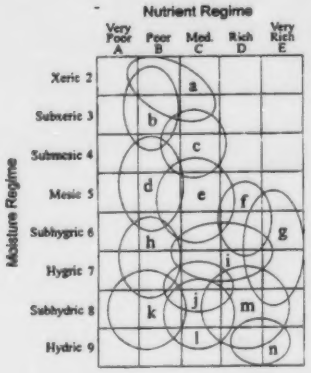
FORAGE PRODUCTION (KG/HA) n=1

Grass	444
Forb	144
Shrub	64
Total	652

SUGGESTED GRAZING CAPACITY HA/AUM

1.4

G3 GRAMINOID MEADOW N = 5



SITE CHARACTERTISTICS

Moisture Regime: mesic[2], subhygric[4], hygric[4]
Nutrient Regime: medium[2], rich[4], very rich[4]
Topographic Position: lower slope
Slope: (2-5)
Aspect: easterly[2], westerly[2], south westerly[6]

PLANT COMMUNITY TYPES (N)

b6 tufted hairgrass-slender wheatgrass/veiny meadow rue (4)
b7 sedge/veiny meadow rue (1)

FORAGE PRODUCTION (KG/HA) n=3

Grass 1250(1144-1355)
Forb 1551(1432-1670)
Shrub 2(0-4)
Total 2803(2580-3025)

SUGGESTED HA/AUM

0.4

CHARACTERISTIC SPECIES

Shrub [1] currant*

Forb [21] veiny meadowrue
[4] common dandelion
[5] fireweed
[13] common yarrow
[11] tall lungwort
[9] american vetch
[6] rough cinquefoil*
[1] northern bedstraw
[4] wild strawberry
[4] Lindley's aster
[3] three-flowered avens*
[2] cream-colored vetchling*
[1] yellow avens*

Grass [2] kentucky bluegrass
[20] tufted hairgrass
[25] carex spp.
[8] slender wheatgrass
[3] smooth brome

* Species characteristic of the phase but occurring in <70% of the sample plots with a prominence value <20.

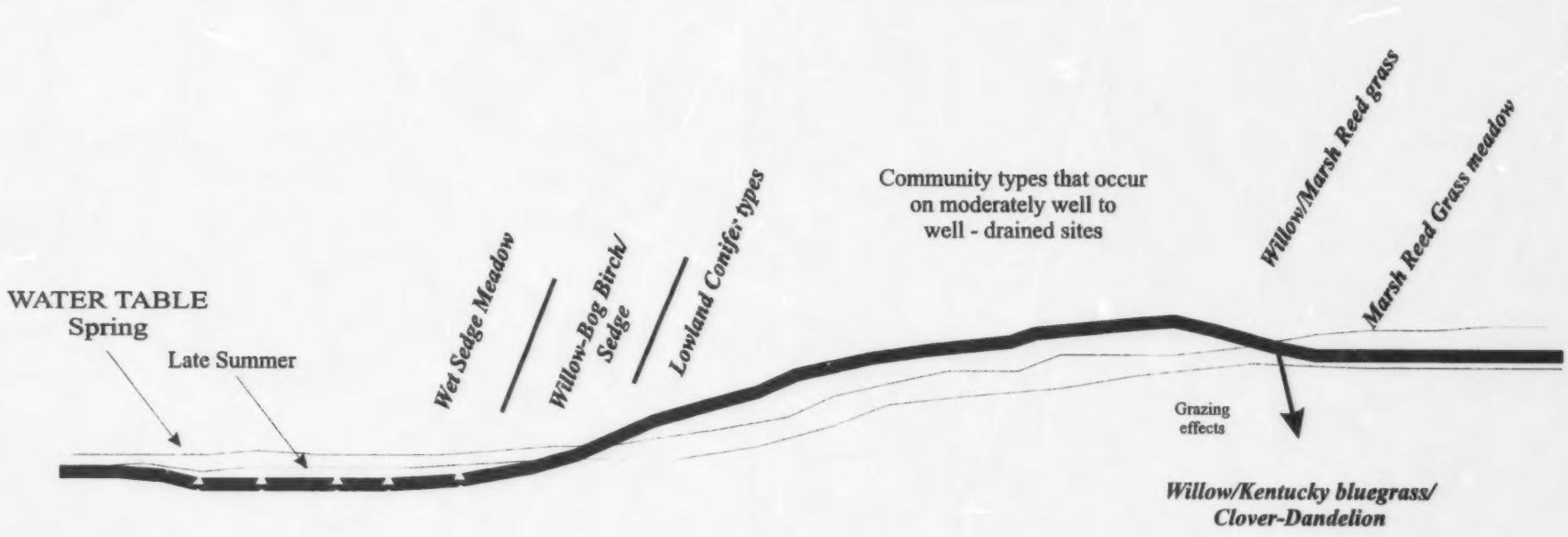


Figure 2: Landscape profile of plant community types for shrublands and native grasslands in lowland areas of the Lower Foothills Subregion

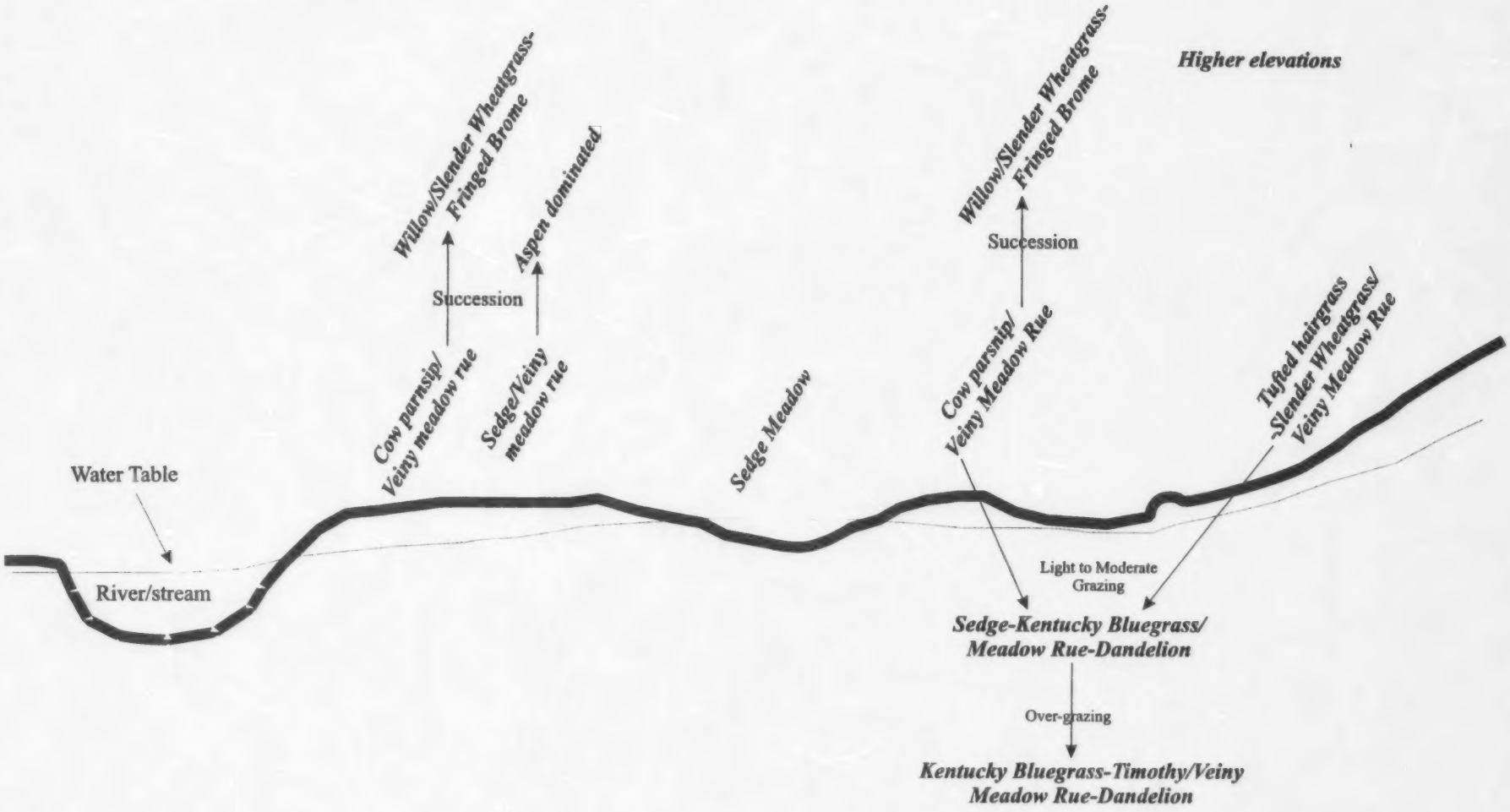


Figure 3: Landscape profile of plant community types for shrublands and native grasslands in riparian areas of the Lower Foothills Subregion

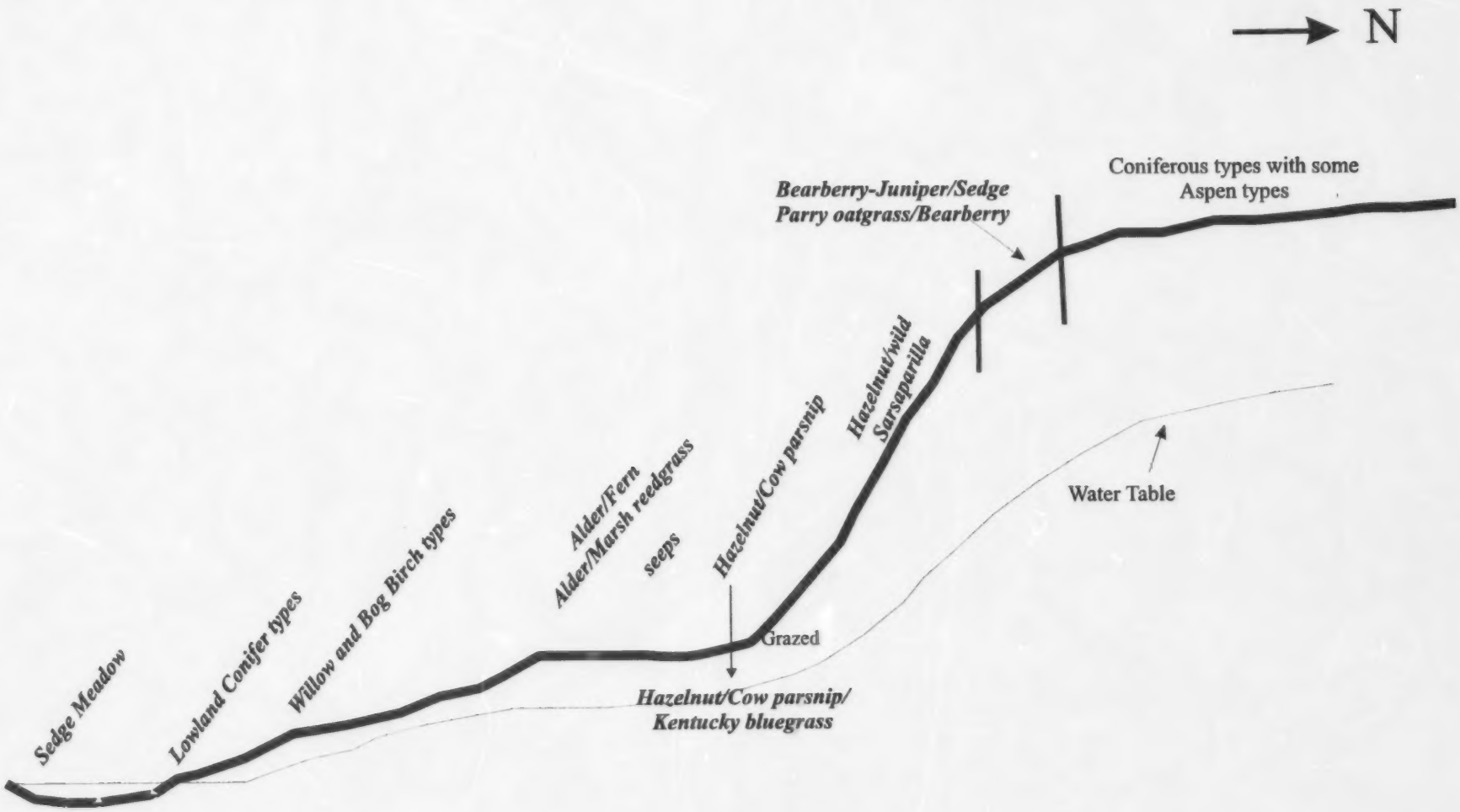


Figure 4: Landscape profile of plant community types for shrublands and native grasslands in upland areas of the Lower Foothills Subregion

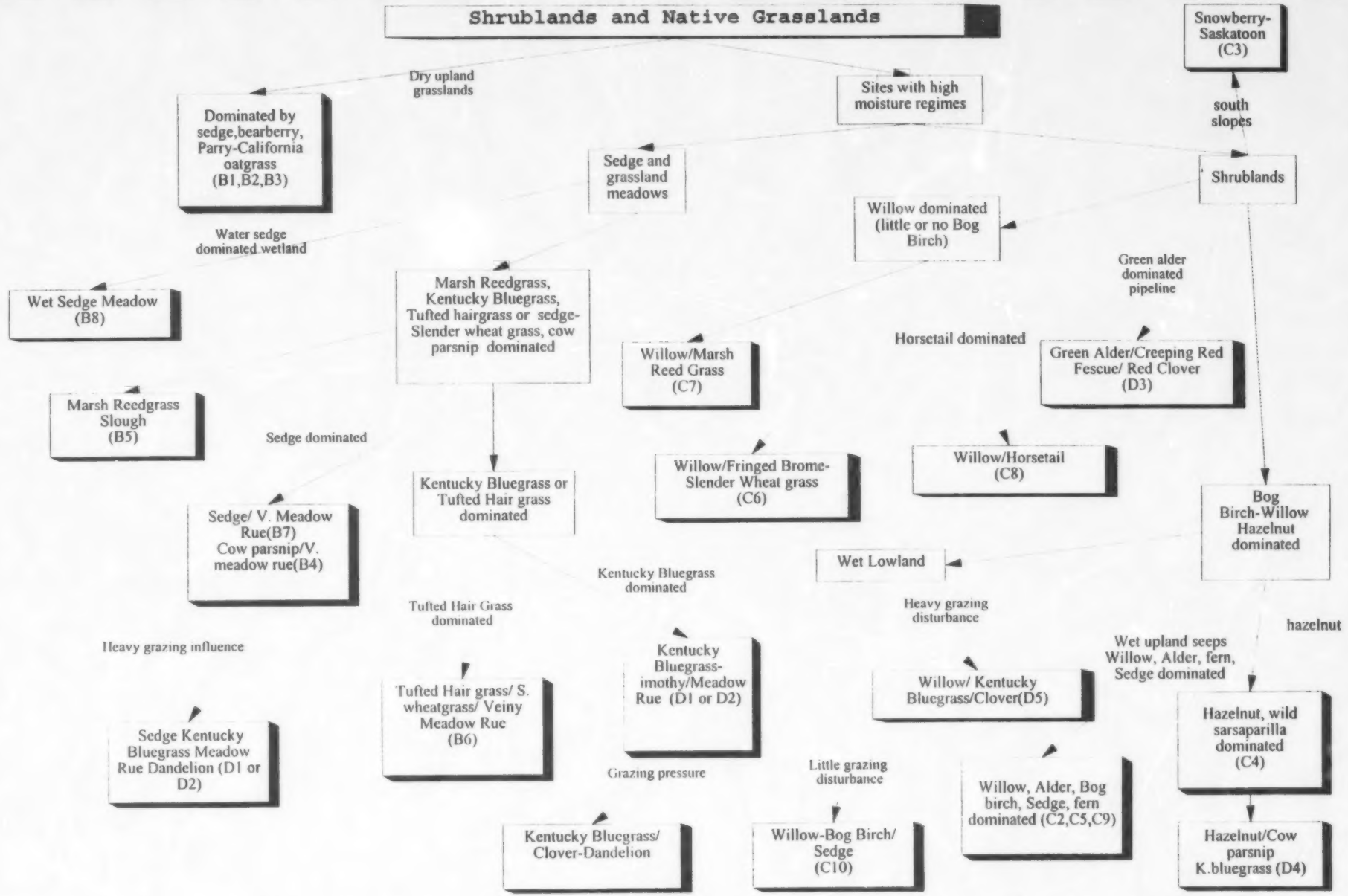

Shrublands and Native Grasslands
Dry upland grasslands
Sites with high moisture regimes
Dominated by sedge,bearberry, Parry-California oatgrass (B1,B2,B3)
Sedge and grassland meadows
Snowberry-Saskatoon (C3)
south slopes
Shrublands
Willow dominated (little or no Bog Birch)
Water sedge dominated wetland
Green alder dominated pipeline
Wet Sedge Meadow (B8)
Marsh Reedgrass, Kentucky Bluegrass, Tufted hairgrass or sedge-Slender wheat grass, cow parsnip dominated
Willow/Marsh Reed Grass (C7)
Horsetail dominated
Green Alder/Creeping Red Fescue/ Red Clover (D3)
Marsh Reedgrass Slough (B5)
Sedge dominated
Willow/Fringed Brome-Slender Wheat grass (C6)
Willow/Horsetail (C8)
Kentucky Bluegrass or Tufted Hair grass dominated
Bog Birch-Willow Hazelnut dominated
Sedge/ V. Meadow Rue(B7) Cow parsnip/V. meadow rue(B4)
Wet Lowland
Kentucky Bluegrass dominated
Heavy grazing disturbance
Tufted Hair Grass dominated
hazelnut
Heavy grazing influence
Kentucky Bluegrass-imothy/Meadow Rue (D1 or D2)
Wet upland seeps Willow, Alder, fern, Sedge dominated
Tufted Hair grass/ S. wheatgrass/ Veiny Meadow Rue (B6)
Willow/ Kentucky Bluegrass/Clover(D5)
Hazelnut, wild sarsaparilla dominated (C4)
Sedge Kentucky Bluegrass Meadow Rue Dandelion (D1 or D2)
Grazing pressure
Little grazing disturbance
Willow, Alder, Bog birch, Sedge, fern dominated (C2,C5,C9)
Kentucky Bluegrass/ Clover-Dandelion
Willow-Bog Birch/ Sedge (C10)
Hazelnut/Cow parsnip K.bluegrass (D4)

Figure 5. Key to shrubland and native grassland community types within the Lower Foothills subregion

b1: Bearberry-Juniper/Sedge

(Arctostaphylos uva-ursi/Juniperus horizontalis/Carex spp.)

n=5 This community type is common on steep, south facing, rapidly drained slopes on the river banks of the Athabasca river and Solomon Creek near Hinton and Grande Cache. The parent materials are glacialfluvial, fluvial and morainal in origin. These grasslands can be considered an edaphic climax as the moisture limitations prevent the establishment of a tree canopy. On the moister sites with shallower slopes grass such as slender wheatgrass and northern wheatgrass can form a significant cover. On the steeper drier slopes there is little grass cover. These sites are generally too steep for livestock grazing, but horses may utilize these sites early in the spring when they are snow free.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
ASPEN (*Populus tremuloides*)	2	0-5	60
SHRUBS			
JUNIPER (*Juniperus horizontalis*)	10	0-29	40
BUFFALOBERRY (*Shepherdia canadensis*)	8	0-16	80
ROSE (*Rosa acicularis*)	5	2-6	100
FORBS			
NORTHERN BEDSTRAW (*Galium borealis*)	3	1-6	100
CUT LV'D ANEMONE (*Anemone multifida*)	2	0-6	80
SMALL LEAVED EVERLASTING (*Antennaria parviflora*)	1	0-2	80
FRINGED SAGE (*Artemisia frigida*)	2	0-10	20
GRASSES			
JUNEGRASS (*Koeleria macrantha*)	1	0-4	80
SEDGE (*Carex spp*)	2	0-7	60
HAIRY WILDRYE (*Elymus innovatus*)	1	0-4	60
NORTHERN WHEATGRASS (*Agropyron dasystachyum*)	2	0-8	20

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: XERIC

NUTRIENT REGIME: SUBMESOTROPHIC

SOIL DRAINAGE: RAPIDLY

ELEVATION: 1089(914-1240)M

SLOPE: 35(10-80)%

FORAGE PRODUCTION(KG/HA)N=4

GRASS	112(50-200)
FORBS	252(68-504)
SHRUBS	144(20-326)
TOTAL	507(252-604)

SUGGESTED GRAZING
1.8 HA/AUM
(NON - USE)

b2: Bearberry/Parry oatgrass

(Arctostaphylos uva-ursi/Danthonia parryi)

n=1 This community type was described on a steep south facing slope overlooking the Red Deer river west of Sundre. It is very similar to the previously described bearberry-juniper dominated community type. Parry oatgrass is common in the foothills of southwestern Alberta, and becomes rarer as one moves north of highway #1. The presence of this grass species indicates an affinity with the grasslands of southwestern Alberta. Willoughby et al. (1998) described a number of grassland communities along the Red Deer river valley that have similar species composition to the Montane grasslands of southern Alberta.

This grassland is too steep and the soils too shallow to support a large amount of forage. As a result this community type should be rated as non-use.

PLANT COMPOSITION

	CANOPY COVER(%) MEAN	RANGE	CONST.
TREES			
ASPEN (*Populus tremuloides*)	10	-	100
SHRUBS			
PIN CHERRY (*Prunus pensylvanica*)	10	-	100
FLAT TOPPED SPIRAEA (*Spiraea betulifolia*)	3	-	100
ROSE (*Rosa acicularis*)	4	-	100
FORBS			
BASTARD'S TOADFLAX (*Commandra umbellata*)	3	-	100
STRAWBERRY (*Fragaria virginiana*)	7	-	100
LOW GOLDENROD (*Solidago multiradiata.*)	5	-	100
HAREBELL (*Campanula rotundifolia*)	2	-	100
GRASSES			
PARRY OATGRASS (*Danthonia parryi*)	7	-	100
SEDGE (*Carex spp*)	2	-	100
HAIRY WILDRYE (*Elymus innovatus*)	4	-	100
SLENDER WHEATGRASS (*Agropyron trachycaulum*)	7	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBXERIC-XERIC

NUTRIENT REGIME: SUBMESOTROPHIC

SOIL DRAINAGE: WELL-RAPIDLY

ELEVATION: 1250 M

SLOPE:25%

ASPECT: SOUTHERLY

FORAGE PRODUCTION(KG/HA): N=1

GRASS	18
FORBS	8
SHRUBS	60
TOTAL	86

SUGGESTED GRAZING

NON-USE

b3: California oatgrass/Bearberry

(Danthonia californica/Arctostaphylos uva-ursi)

n=1 This community type was described in the Saddle hills northwest of Grande Prairie. This community is similar to the community described by Wilkinson and Johnson (1982) on darked colored solonetzic soils on gentle to level areas throughout the Dry Mixedwood subregion. Wilkinson and Johnson (1982), found there was a close correlation between large tracts of prairie vegetation and the distribution of solonetzic soils in the Peace River district of Alberta. They specifically described Western porcupine grass-Sedge/Fringed sage community on steep south -facing slopes and a Sedge-California oatgrass-Western porcupine grass on more gentle slopes. They felt the solonetzic soils supported grasslands and not forests because of their unfavourable ratios of Ca and Na, hard, columnar B-horizon, and relatively impermeable clay pan close to the surface. This community type appears to more similar to their Sedge-California oatgrass-Western porcupine grass community type.

This community type would be rated as primary range.

PLANT COMPOSITION

	CANOPY COVER(%) MEAN	RANGE	CONST.
TREES			
ASPEN (*Populus tremuloides*)	9	-	100
SHRUBS			
SASKATOON (*Amelanchier alnifolia*)	4	-	100
SNOWBERRY (*Symphoricarpos albus*)	1	-	100
ROSE (*Rosa acicularis*)	7	-	100
FORBS			
NORTHERN BEDSTRAW (*Galium boreale*)	6	-	100
STRAWBERRY (*Fragaria virginiana*)	9	-	100
ASTER SPP. (*Aster spp.*)	6	-	100
YELLOW PEAVINE (*Lathyrus ochroleucus*	6	-	100
GRASSES			
CALIFORNIA OATGRASS (*Danthonia californica*)	20	-	100
SEDGE (*Carex spp*)	14	-	100
HAIRY WILDRYE (*Elymus innovatus*)	14	-	100
PURPLE OATGRASS (*Schizachne purpurascens*)	4	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBMESIC-MESIC

NUTRIENT REGIME: SUBMESOTROPHIC-MESOTROPHIC

SOIL DRAINAGE: WELL

ELEVATION: 910M

SLOPE:2%

ASPECT: SOUTHERLY

FORAGE PRODUCTION(KG/HA) N=1

GRASS	444
FORBS	144
SHRUBS	64
TOTAL	652

SUGGESTED GRAZING
1.4 HA/AUM

b4: Cow parsnip/Veiny meadow rue

(Heracleum lanatum/Thalictrum venulosum)

n=1 This community type occurs at higher elevations on moist, level valley flood plains and fluvial terraces in the Lower Foothills Subregion. The water table is fairly high, but flooding is rare. The soils are nutrient rich and generally have a silty loam texture.

This community type is highly productive for both cattle and wildlife but, if left undisturbed, it will quickly be invaded by willow to form the Willow/Slender wheatgrass-Fringed brome community type . This community is often heavily utilized by livestock and is often invaded by timothy, Kentucky bluegrass and clover species.

PLANT COMPOSITION

	CANOPY COVER(%) MEAN	RANGE	CONST.
SHRUBS			
WILLOW *(Salix spp.)*	1	-	100
FORBS			
VEINY MEADOW RUE *(Thalictrum venulosum)*	39	-	100
LINDLEY'S ASTER *Aster ciliolatus)*	1	-	100
STRAWBERRY *(Fragaria virginiana)*	4	-	100
TALL LUNGWORT *(Mertensia paniculata)*	13	-	100
COMMON YARROW *(Achillea millefolium)*	18	-	100
DANDELION *(Taraxacum officinale)*	1	-	100
COW PARSNIP *(Heracleum lanatum)*	13	-	100
FIREWEED *(Epilobium angustifolium)*	5	-	100
AMERICAN VETCH *(Vicia americana)*	3	-	100
GRASSES			
SLENDER WHEAT GRASS *(Agropyron trachycaulum)*	2	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC TO HYGRIC
NUTRIENT REGIME: PERMESOTROPHIC
SOIL DRAINAGE: MODERATELY WELL
ELEVATION: 1270 M
SLOPE: 0 - 2 %

FORAGE PRODUCTION(KG/HA) N=1

GRASS	1200
FORBS	800
SHRUBS	100
TOTAL	2100

SUGGESTED GRAZING
0.4 HA/AUM

b5: Tufted Hair Grass-Slender wheatgrass/Veiny Meadow Rue

(Deschampsia cespitosa-Agropyron trachycaulum/Thalictrum venulosum)

n=4 This community type occurs at higher elevations on moist, level, valley flood plains and fluvial terraces in the Lower Foothills Subregion. The water table is usually high, but flooding is rare.

When these sites are protected from grazing, willow and bog birch expand, grasses decline, and taller forbs start to dominate. Past wildfires have played an important role in controlling shrub growth within this community type. Long-term heavy grazing pressure will lead to a community that is dominated by Kentucky bluegrass, clover and dandelion.

This community type is very similar to the tufted hair grass-dominated communities described in the Upper Foothills subregion (Willoughby and Smith 1997). The presence of tufted hair grass appears to indicate the transition to the Upper Foothills subregion.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
FORBS			
ROUGH CINQUEFOIL *(Potentilla norvegica)*	8	0-21	50
VEINY MEADOW RUE *(Thalictrum venulosum)*	22	2-37	100
COMMON YARROW *(Achillea millefolium)*	14	5-23	100
FIREWEED *(Epilobium angustifolium)*	3	0-13	25
LINDLEY'S ASTER *(Aster ciliolatus)*	3	1-9	100
TALL LUNGWORT (BLUEBELLS) *(Mertensia paniculata)*	9	2-17	100
SMOOTH ASTER *(Aster laevis)*	1	0-4	25
DANDELION *(Taraxacum officinale)*	3	0-7	75
NORTHERN BEDSTRAW *(Galium boreale)*	1	1-2	100
GRASSES			
TUFTED HAIR GRASS *(Deschampsia cespitosa)*	25	4-41	100
SLENDER WHEATGRASS *(Agropyron trachycaulum)*	10	1-21	100
SEDGE SPP. *(Carex spp.)*	17	4-41	75

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC

NUTRIENT REGIME:
MESOTROPHIC TO PERMESOTROPHIC

SOIL DRAINAGE: IMPERFECTLY TO MOD. WELL

ELEVATION: 1313(1113-1415) M

SLOPE: 2(2-3) %

ASPECT: WESTERLY

FORAGE PRODUCTION(KG/HA): N=1

GRASS	1355
FORBS	1670
SHRUBS	0
TOTAL	3025

SUGGESTED GRAZING
0.3 HA/AUM

b6: Sedge/ Veiny Meadow Rue

(Carex spp./ Thalictrum venulosum)

n=1 This community type was described on fluvial deposits adjacent to a creek in the Saddle Hills northwest of Grande Prairie. It is similar to the Cow parsnip/Veiny meadow rue community previously described, but lacks the cover of cow parsnip. The lack of cow parsnip and presence of aspen appears to indicate better drainage and poorer nutrients. It is likely that this community will succeed to an aspen dominated community in the absence of disturbance. This community is moderately productive and is easily accessible to livestock. It should be rated as primary range.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
ASPEN (*Populus tremuloides*)	8	-	100
SHRUBS			
GOOSEBERRY (*Ribes oxycanthoides*)	4	-	100
FORBS			
VEINY MEADOW RUE *(Thalictrum venulosum)*	17	-	100
COMMON YARROW *(Achillea millefolium)*	10	-	100
AMERICAN VETCH *(Vicia americana)*	7	-	100
TALL LUNGWORT (BLUEBELLS) *(Mertensia paniculata)*	20	-	100
OLD MAN'S WHISKERS *(Geum triflorum)*	16	-	100
DANDELION *(Taraxacum officinale)*	6	-	100
FIREWEED *(Epilobium angustifolium)*	9	-	100
STRAWBERRY *(Fragaria virginiana)*	10	-	100
GRASSES			
SEDGE *(Carex spp.)*	61	-	100
SLENDER WHEAT GRASS *(Agropyron trachycaulum)*	2	-	100
FRINGED BROME GRASS *(Bromus ciliatus)*	12	-	100
HAIRY WILDRYE *(Elymus innovatus)*	8	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: PERMESOTROPHIC

SOIL DRAINAGE: MODERATELY WELL TO WELL

ELEVATION: 910 M

FORAGE PRODUCTION(KG/HA): N=1

GRASS	1144
FORBS	1432
SHRUBS	4
TOTAL	2580

SUGGESTED GRAZING
0.4 HA/AUM

b7: Marsh Reed Grass Slough

(Calamagrostis canadensis)

n=1 This community type occurs on very moist, depressional areas. It will occur on the fringes around marshes or sedge meadows and in the center of willow rings on upland sites. Unlike sedge meadows, these areas are only flooded in the spring and early summer; which allows marsh reed grass to dominate instead of sedges.

This community type is productive and livestock useage may occur during the later part of summer when the area dries out and access improves. Livestock use of this community type will not be extensive and should be rated as non-use.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
WILLOW			
(Salix spp.)	9	-	100
FORBS			
FIREWEED			
(Epilobium angustifolium)	5	-	100
FIELD HORSETAIL			
(Equisetum arvense)	1	-	100
GRASSES			
MARSH REED GRASS			
(Calamagrostis canadensis)	95	-	100
MOSSES			
MOSS SPP.	16	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBHYGRIC TO SUBHYDRIC

NUTRIENT REGIME:
PERMESOTROPHIC TO EUTROPHIC

SOIL DRAINAGE:
IMPERFECTLY TO POORLY

ELEVATION: 914 M

SLOPE: N/A

FORAGE PRODUCTION(KG/HA): N=1

GRASS	1448
FORBS	0
SHRUBS	196
TOTAL	1644

SUGGESTED GRAZING
NON-USE

b8: Wet Sedge Meadow

(Carex aquatalis - Carex rostrata)

n=2 This community type is found in areas that are flooded for most of the growing season. It occurs on wetter sites than the Marsh Reed Grass community type. Succession within this community type is very slow and proceeds with organic matter accumulations (Beckingham 1994). Therefore, this community type can be considered the potential natural vegetation for the site.

Although this community type is very productive, it is essentially non-use becauseof the wet soil conditions which makes livestock access difficult.

PLANT COMPOSITION

	CANOPY COVER(%) MEAN	RANGE	CONST.
SHRUBS			
WILLOW			
(Salix spp.)	1	0-2	50
FORBS			
WILD LILY-OF-THE-VALLEY			
(*Maianthemum canadense*)	1	0-1	50
GRASSES			
WATER SEDGE			
(Carex aquatilis)	51	22-80	100
BEAKED SEDGE			
(Carex rostrata)	1	0-1	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: HYDRIC

NUTRIENT REGIME:
PERMESOTROPHIC - EUTROPHIC

SOIL DRAINAGE:
POORLY TO VERY POORLY

ELEVATION: 1133(975 - 1290) M

FORAGE PRODUCTION(KG/HA): N=2

GRASS	2061(2042-2079)
FORBS	0
SHRUBS	0
TOTAL	2061(2042-2079)

SUGGESTED GRAZING
(NON - USE)

NATIVE SHRUBLANDS

OF THE

LOWER FOOTHILLS SUBREGION

Photo 7: This photo of the Baptiste River illustrates a progression of communities from wetter areas near the river to drier communities at the edge where willow communities predominate.

Table 6. Forage production summary for native shrublands of the Lower Foothills subregion

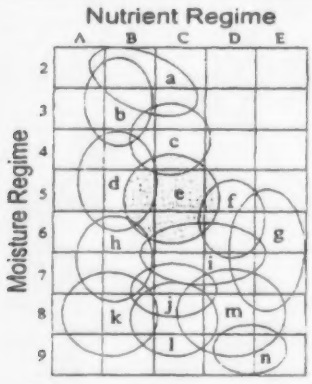
Ecosite		Community type	Forage productivity(kg/ha) Grass	Forb	Shrub	Total	Sample size n	Carrying Capacity (Ha/AUM)
c hairy wild rye submesic/medium	**Ecosite phase c5 shrubland**		**92**	**176**	**984**	**1252**	**1**	**1.5**
	c1	rose-blueberry/schreber's moss	92	176	984	1252	1	1.5
e low-bush cranberry mesic/medium	**Ecosite phase e5 shrubland**		**576**	**824**	**376**	**1776**	**3**	**1.5**
	c2	snowberry-saskatoon	94	359	222	675	1	2.7
	c3	hazelnut/wild sarsaparilla	1057	1289	530	2876	2	0.6
	Ecosite phase e5_grazed shrubland		**2644**	**342**	**480**	**3466**	**1**	**0.3**
	d3	alder/creeping red fescue/clover	2644	342	480	3466	1	0.3
f bracted honey-suckle subhygric/ rich	**Ecosite phase f5 shrubland**		**1125**	**372**	**388**	**1885**	**6**	**1.0**
	c4	willow-bog birch/graceful sedge	1125	372	388	1885	6	1.0
	Ecosite phase f5_grazed shrubland		**164**	**1066**	**446**	**1676**	**1**	**1.1**
	d4	hazelnut/cowparsnip/kentucky bluegrass	164	1066	446	1676	1	1.1
g meadow subhygric/very rich	**Ecosite phase g1 shrubby meadow**		**1836**	**831**	**132**	**2798**	**8**	**0.4**
	c5	willow/slender wheatgrass-f. brome	1467	842	264	2573	6	0.7
	c6	willow/marsh reedgrass	2204	820	0	3024	2	0.3

	Ecosite phase g1_grazed shrubby meadow		**1325**	**787**	**53**	**2165**	**4**	**0.4**
	d5	willow/kentucky bluegrass/clover	1325	787	53	2165	4	0.4
i horsetail	**Ecosite phase i4 shrubland**		**880**	**630**	**161**	**1671**	**4**	**1.2**
hygric/rich	c7	alder/marsh reedgrass	2386	1350	46	3782	1	0.2
	c8	willow/horsetail	130	207	60	397	1	non-use
	c9	willow-alder/fern	124	333	378	835	2	non-use
m rich fen	**Ecosite phase m2 shrubby rich fen**		**1631**	**1120**	**371**	**3048**	**5**	**non-use**
subhydric/ rich	c10	willow-bog birch/water sedge	1631	1120	371	3048	5	non-use

*estimate

e5 low-bush cranberry shrubland

n=6



CHARACTERISTIC SPECIES

Shrub
- [1] willow*
- [7] wild red raspberry
- [6] prickly rose
- [7] snowberry*
- [5] saskatoon
- [2] beaked hazelnut*

Forb
- [2] fireweed
- [12] wild sarsaparilla*
- [1] wild strawberry
- [6] showy aster*
- [3] tall lungwort
- [3] northern bedstraw
- [3] american vetch
- [1] veiny meadowrue
- [1] cream-colored vetchling*
- [1] dandelion*

Grass
- [3] marsh reedgrass
- [5] carex spp.*
- [5] slender wheatgrass
- [3] fringed brome
- [2] kentucky bluegrass*
- [1] hairy wild rye*

SITE CHARACTERTISTICS

Moisture Regime: submesic[3], mesic[5], hygric[2]
Nutrient Regime: medium[10]
Topographic Position: lower slope[2], mid slope[2], upper slope[6]
Slope: (6-9)[2], (10-15)[4], (16-30)[2]
Aspect: easterly[2], southerly[8]

PLANT COMMUNITY TYPES (N)

c3 snowberry-saskatoon (1)
c4 hazelnut/wild sarsaparilla (2)

FORAGE PRODUCTION (KG/HA) n=3

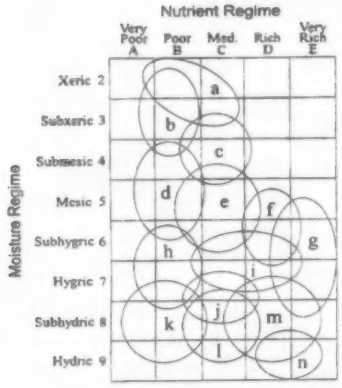
Grass 576(94-1057)
Forb 824(359-1289)
Shrub 376(222-530)
Total 1776(675-2876)

SUGGESTED GRAZING CAPACITY HA/AUM

1.5

* Species characteristic of the phase but occurring in <70% of the sample plots with a prominence value <20.

g1 shrubby meadow_grazed n = 16



CHARACTERISTIC SPECIES

Shrub [40] willow
[2] bog birch*
[1] currant*

Forb [22] clover spp.
[12] common dandelion
[7] veiny meadowrue
[6]star-floweredfalseSolomons-seal*
[5] Lindley's aster
[3] wild red strawberry
[3] common yarrow
[2] northern bedstraw*
[2] american vetch*
[2] tall buttercup*
[1] tall lungwort*
[1] stinging nettle*

Grass[23] kentucky bluegrass
[5] marsh reedgrass*
[4] slender wheatgrass
[4] carex spp.
[4] timothy
[2] tufted hairgrass*

SITE CHARACTERTISTICS

Moisture Regime: mesic[2], subhygric[4], hygric[4]
Nutrient Regime: medium[6], rich[4]
Topographic Position: lower slope
Slope: (2-5)
Aspect: south westerly

SOIL CHARACTERISTICS**

Organic Thickness: (6-15)[8], (0-5)[2]
Humus form: mull[5], mor[3], raw moder[2]
Surface Texture: SiC[4], SiL[1], SL[1] SCL[1], L[1], CL[1]
Effective Texture: SiC[5], SiL[1], SiCL[1], SL[1], SL[1], SCL[1]
Depth to Mottles/Gley: (0-25)[5], (51-100)[3], (26-50)[3]
Drainage: imperfect[6], poor[4]
Parent Material: F[9], M[1]
Soil Subgroup: R.HG[4], O.R , R.G , O.G , GLCU.R[1]
Soil type: SWm[5], SWp[3], SM4[2]

PLANT COMMUNITY TYPES (N)

d5 willow/kentucky bluegrass/clover (9)

FORAGE PRODUCTION (KG/HA) n=4

Grass 1325 (152-4088)
Forb 787 (558-1218)
Shrub 53 (0-80)
Total 2165 (1138-4646)

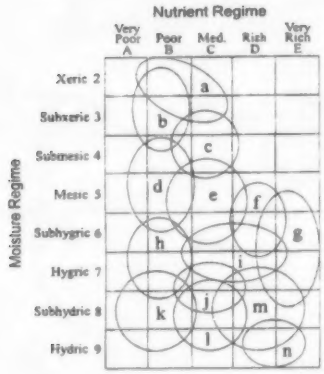
SUGGESTED HA/AUM

0.4

* Species characteristic of the phase but occurring in <70% of the sample plots with a prominence value <20.

** Soil Characteristics are from g1 shrubby meadow Ecosite Phase summary.

i4 horsetail shrubland n = 5



CHARACTERISTIC SPECIES

Shrub [28] willow spp.
[17] river alder
[14] bracted honeysuckle
[6] green alder
[5] low-bush cranberry
[4] currant spp.
[6] wild red raspberry
[2] prickly rose*

Forb [9] cowparsnip
[7] common horsetail
[5] spiny wood fern*
[4] dewberry
[3] red and white baneberry
[4] tall lungwort
[3] wild sarsaparilla*
[6] fireweed*
[2] stinging nettle*
[2] large-leaved avens*
[1] Lindley's aster

Grass[29] marsh reedgrass
[2] carex spp.
[2] fringed brome

SITE CHARACTERTISTICS

Moisture Regime: hygric[10]
Nutrient Regime: rich[10]
Topographic Position: lower slope
Slope: (2-5)
Aspect: north[5], northeasterly[5]

PLANT COMMUNITY TYPES (N)

c8 alder/marsh reedgrass(1)
c9 willow/horsetail (1)
c10 willow-alder/horsetail (4)

FORAGE PRODUCTION (KG/HA) n=4

Grass	880(124-2386)
Forb	630(204-1350)
Shrub	161(46-378)
Total	1671(397-3782)

SUGGESTED HA/AUM

1.2

* Species characteristic of the phase but occurring in <70% of the sample plots with a prominence value <20.

** Soil Characteristics are from g1 shrubby meadow Ecosite Phase summary.

c1: Rose-Blueberry/Schreber's moss

(Rosa acicularis-Vaccinium cespitosa/Pleurozium schreberi)

n=1 This community type occurs in small isolated openings within the aspen dominated forests of the Saddle Hills northwest of Grande Prairie. These sites appear to have gravelly, well drained soils which inhibit the growth of trees and allow shrubs such as rose and blueberry to dominate. This community is moderately productive, with the majority of the production coming from shrubs which are moderately palatable to livestock this community should be rated as secondary range.

PLANT COMPOSITION

	CANOPY COVER(%) MEAN	RANGE	CONST.
TREE			
ASPEN (*Populus tremuloides*)	3	-	100
SHRUBS			
WILLOW (*Salix spp.*)	3	-	100
ROSE (*Rosa acicularis*)	29	-	100
BLUEBERRY (*Vaccinium caespitosum*)	17	-	100
BUFFALOBERRY (*Shepherdia canadensis*)	10	-	100
FORBS			
WILD STRAWBERRY (*Fragaria virginiana*)	15	-	100
LINDLEY'S ASTER (*Aster ciliolatus*)	1	-	100
DANDELION (*Taraxacum offincinale*)	7	-	100
YARROW (*Achillea millefolium*)	6	-	100
GRASSES			
HAIRY WILDRYE (*Elymus innovatus*)	8	-	100
MARSH REED GRASS (*Calamagrostis canadensis*)	1	-	100
PURPLE OAT GRASS (*Schizachne purpurascens*)	5	-	100
FRINGED BROME GRASS (*Bromus ciliatus*)	1	-	100
MOSSES			
Moss spp.			44

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: MESOTROPHIC-SUBMESOTROPHIC

SOIL DRAINAGE: WELL

ELEVATION:910 M

FORAGE PRODUCTION(KG/HA):N=1

GRASS	92
FORBS	176
SHRUBS	984
TOTAL	1252

SUGGESTED GRAZING
1.5 HA/AUM

c2: Snowberry-Saskatoon

(Symphoricarpos occidentalis-Amelanchier alnifolia)

n=1 This community type is found on south and west facing slopes overlooking rivers and creeks throughout the Lower Foothills subregion. These sites are generally well drained, and appear to have a slightly higher nutrient regime than the modal mesic/medium sites. It is possible that these sites receive some nutrient rich seepage at sometime during the year. Succession in the absence of disturbance is to an Aw/Saskatoon or Aw/Snowberry community type. These community types are moderately productive, but the steep slopes, and high shrub cover generally restrict their use by livestock. Consequently they should be rated as secondary or non-use range.

PLANT COMPOSITION

	CANOPY COVER(%) MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	8	-	100
SHRUBS			
CHOKECHERRY *(Prunus virginiana.)*	6	-	100
SASKATOON *(Amelanchier alnifolia)*	12	-	100
ROSE *(Rosa acicularis)*	1	-	100
SNOWBERRY *(Symphoricarpos occidentalis)*	20	-	100
FORBS			
STRAWBERRY *(Fragaria virginiana)*	2	-	100
SHOWY ASTER *(Aster conspicuus)*	3	-	100
NORTHERN BEDSTRAW *(Galium boreale)*	5	-	100
COMMON YARROW *(Achillea millefolium)*	3	-	100
GRASSES			
SLENDER WHEATGRASS *(Agropyron trachycaulum)*	10	-	100
UPLAND SEDGE *(Carex spp.)*	15	-	100
FRINGED BROME *(Bromus ciliatus)*	10	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC
NUTRIENT REGIME: MESOTROPHIC-PERMESOTROPHIC
SOIL DRAINAGE: WELL
ELEVATION: 643 M
SLOPE: 35 %
ASPECT: SOUTH

FORAGE PRODUCTION(KG/HA): N=1

GRASS	94
FORBS	359
SHRUBS	222
TOTAL	675

SUGGESTED GRAZING
2.7 HA/AUM

c3: Hazelnut/Wild sarsaparilla

(Corylus cornuta/Aralia nudicaulis)

n=2 This community type occurs in small isolated openings within the aspen dominated forests near Whitecourt Mountain southwest of Whitecourt. These sites occur on south and west facing slopes. These sites were probably created after a fire burned through the area and the higher insolation has limited tree growth. On moister, lower slope positions cow parsnip can dominate this community type. These sites are moderately productive but the high shrub cover generally restricts their use by livestock. Consequently, these community types should be rated as secondary range. Succession in the absence of disturbance will be to aspen.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
ASPEN			
(*Populus tremuloides*)	8	6-10	100
SHRUBS			
HAZELNUT			
(*Corylus cornuta.*)	3	2-3	100
ROSE			
(*Rosa acicularis*)	5	4-5	100
FORBS			
WILD SARSAPARILLA			
(*Aralia nudicaulis*)	17	16-18	100
LINDLEY'S ASTER			
(*Aster ciliolatus*)	2	1-4	100
SHOWY ASTER			
(*Aster conspicuus*)	8	6-9	100
CANADA VIOLET			
(*Viola canadensis*)	4	1-7	100
TALL LUNGWORT			
(*Mertensia paniculata*)	4	1-7	100
FIREWEED			
(*Epilobium angustifolium*)	3	1-3	100
WILD STRAWBERRY			
(*Fragaria virginiana*)	1	0-2	50
DOGBANE			
(*Apocynum androsaefolium*)	6	0-11	50
GRASSES			
FRINGED BROME			
(*Bromus ciliatus*)	6	1-10	100
MARSH REED GRASS			
(*Calamagrostis canadensis*)	5	3-6	100
SLENDER WHEATGRASS			
(*Agropyron trachycaulum*)	2	1-2	100
KENTUCKY BLUEGRASS			
(*Poa pratensis*)	3	0-5	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: MESOTROPHIC-PERMESOTROPHIC

SOIL DRAINAGE: WELL

ELEVATION: 1050 M

SLOPE: 17%

ASPECT: SOUTHERLY

FORAGE PRODUCTION(KG/HA): N=2

GRASS	1057(716-1398)
FORBS	1289(966-1611)
SHRUBS	530(434-626)
TOTAL	2876(2798-2953)

SUGGESTED GRAZING
0.6 HA/AUM

c4: Willow-Bog Birch/ Graceful sedge

(Salix spp. - Betula glandulosa/ Schizachne purpurascens)

n=22 This community type is drier than the Willow/Marsh Reed Grass or Willow-Bog birch/Water sedge community types. The water table is high enough on this community type to support the growth of willow and bog birch, but there is good drainage at the surface that favors the growth of mesic grass and forb species (hairy wildrye, graceful sedge, purple oatgrass, yellow peavine and fireweed). Livestock can usually easily access these sites. Therefore this community should be rated as primary range.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
WILLOW			
(Salix spp.)	27	2-60	100
BOG BIRCH			
(Betula glandulosa)	40	0-80	86
FORBS			
STRAWBERRY			
(Fragaria virginiana)	4	0-17	52
LINDLEY'S ASTER			
(Aster ciliatus)	2	0-15	44
VEINY MEADOW RUE			
(Thalictrum venulosum)	2	0-10	52
FIREWEED			
(Epilobium angustifolium)	1	0-10	39
COMMON YARROW			
(Achillea millefolium)	1	0-5	61
YELLOW PEAVINE			
(Lathyrus ochroleucus)	2	0-10	44
GRASSES			
PURPLE OAT GRASS			
(Schizachne purpurascens)	5	0-38	39
UPLAND SEDGE			
(Carex spp.)	25	0-50	100
KENTUCKY BLUEGRASS			
(Poa pratensis)	2	0-8	57
MARSH REEDGRASS			
(Calamagrostis canadensis)	4	0-32	57

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC
NUTRIENT REGIME: MESOTROPHIC-PERMESOTROPHIC
SOIL DRAINAGE: WELL
ELEVATION: 1203(914-1572) M
SLOPE: 0 - 7 %
ASPECT: VARIABLE

FORAGE PRODUCTION(KG/HA): N=6

GRASS	1125(230-2872)
FORBS	372(4-890)
SHRUBS	388(0-780)
TOTAL	1885(704-2900)

SUGGESTED GRAZING
1.0 HA/AUM

c5: Willow/Slender Wheat Grass-Fringed Brome Grass

(Salix spp./Agropyron trachycaulum-Bromus ciliatus)

n=6 This community type occurs at higher elevations on moist, level valley flood plains and fluvial terraces in the Lower Foothills Subregion. The water table is fairly high, but flooding is rare.

A variant of this community type, the Cow parsnip/Veiny Meadow rue community type, is common along the Baptiste River at the upper elevational limit of the Lower Foothills subregion. The Cow parsnip/Veiny Meadow rue community type is highly productive for both cattle and wildlife but, if left undisturbed, it will quickly be invaded by willow to form this community type. From a grazing perspective this community is of limited value because of the high shrub cover. In order to make this community type more favorable for grazing, prescribed burning or mechanical brushing should be used to remove the high shrub cover.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
WILLOW			
(Salix spp.)	58	37-90	100
BOG BIRCH			
(Betula glandulosa)	3	0-10	67
FORBS			
WILD STRAWBERRY			
(Fragaria virginiana)	9	0-39	83
LINDLEY'S ASTER			
(Aster ciliolatus)	9	0-27	83
TALL LUNGWORT			
(Mertensia paniculata)	11	0-19	83
VEINY MEADOW RUE			
(Thalictrum venulosum)	10	0-35	83
TALL LARKSPUR			
(Delphinium glaucum)	5	0-5	83
CREAM COLOURED VETCHLING			
(Lathyrus ochroleucus)	1	0-2	50
FIREWEED			
(Epilobium angustifolium)	4	0-7	83
GRASSES			
SLENDER WHEATGRASS			
(Agropyron trachycaulum)	11	4-22	100
FRINGED BROME			
(Bromus ciliatus)	8	3-12	100
GRACEFUL SEDGE			
(Carex praegracilis.)	4	0-7	83
MARSH REED GRASS			
(Calamagrostis canadensis)	7	0-23	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC

NUTRIENT REGIME: PERMESOTROPHIC

SOIL DRAINAGE: WELL TO MOD. WELL

ELEVATION: 1073(853-1220) M

SLOPE: N/A

FORAGE PRODUCTION(KG/HA) N=6

GRASS	1467(156-4088)
FORBS	842(422-1186)
SHRUBS	264(0-766)
TOTAL	2573(946-4646)

SUGGESTED GRAZING
0.7 HA/AUM

c6: Willow/ Marsh Reed Grass

(Salix spp./ Calamagrostis canadensis)

n=10 This community type occurs as small willow pockets in depressions on upland sites and as a transitional community type between wet lowland community types and drier upland community types. It occurs in areas where the water table is high in the spring (with frequent flooding).

This is usually considered to be secondary range because it will only be used if the surrounding upland sites are depleted of forage. These sites may become primary range if the livestock have to pass through them to get to water or if they occur within a highly productive primary range area.

As organic matter accumulates and these sites begin to dry out, black spruce, tamarack, balsam poplar, or paper birch may establish (Beckingham 1993). These community types tend to persist for long periods of time before they undergo succession to forest.

PLANT COMPOSITION

	CANOPY COVER(%) MEAN	RANGE	CONST.
SHRUBS			
WILLOW *(Salix spp.)*	46	10-80	100
BRACTED HONEYSUCKLE *(Lonicera involucrata)*	5	0-31	50
WILD RED RASPBERRY *(Rubus idaeus)*	8	0-40	50
FORBS			
LINDLEY'S ASTER *(Aster ciliolatus)*	3	0-13	70
YELLOW AVENS *(Geum aleppicum)*	2	0-11	20
STINGING NETTLE *(Urtica dioica)*	6	0-30	40
COMMON YARROW *(Achillea millefolium)*	2	0-9	60
VEINY MEADOW RUE *(Thalictrum venulosum)*	2	0-8	40
FIELD HORSETAIL *(Equisetum arvense)*	1	0-1	50
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	27	0-80	90
WATER SEDGE *(Carex aquatilis)*	1	0-10	20
KENTUCKY BLUEGRASS *(Poa pratensis)*	1	0-9	40

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC

NUTRIENT REGIME: PERMESOTROPHIC

SOIL DRAINAGE: POORLY TO IMPERFECTLY

ELEVATION: 915(818-1205) M

SLOPE:N/A

FORAGE PRODUCTION(KG/HA): N=2

GRASS	2204(688-3720)
FORBS	820(742-898)
SHRUBS	0
TOTAL	3024(1586-4462)

SUGGESTED GRAZING
0.3 HA/AUM

c7: Alder/Marsh reedgrass

(Alnus crispa/Calamagrostis canadensis)

n=1 This community type was described on north and east facing slopes West of Sundre. This community appears to occupy areas that receive some nutrient rich seepage throughout the growing season. There are some trees growing on these sites, but they are generally restricted to the drier areas. This community is similar to the Alder/Fern community that was described on nutrient rich seepage areas in the Saddle Hills, but this type lacks the cover of fern. This community type is very productive, but it is difficult to graze because of the slope and the high cover of alder which restricts livestock movement. This community type should be rated as secondary range.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
ASPEN (*Populus tremuloides*)	2	-	100
WHITE SPRUCE (*Picea glauca*)	2	-	100
SHRUBS			
GREEN ALDER (*Alnus crispa.*)	36	-	100
RED RASPBERRY (*Rubus ideaus*)	18	-	100
WILLOW (*Salix bebbiana*)	5	-	100
FORBS			
FIREWEED (*Epilobium angustifolium*)	25	-	100
COW PARSNIP (*Heracleum lanatum*)	3	-	100
STINGING NETTLE (*Urtica dioica*)	4	-	100
TALL LUNGWORT (*Mertensia paniculata*)	4	-	100
GRASSES			
FOWL BLUEGRASS (*Poa palustris*)	8	-	100
MARSH REED GRASS (*Calamagrostis canadensis*)	26	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC

NUTRIENT REGIME: PERMESOTROPHIC

SOIL DRAINAGE: MODERATELY WELL

ELEVATION: 1300 M

SLOPE: 10%

ASPECT: EASTERLY

FORAGE PRODUCTION(KG/HA) N=1

GRASS	2386
FORBS	1350
SHRUBS	46
TOTAL	3782

SUGGESTED GRAZING
0.2 HA/AUM

c8: Willow/ Horsetail

(Salix spp./ Equisetum arvense)

n=1 This community type appears to be transitional between the horsetail (hygric/rich) and shrubby rich fen (subhydric/rich) ecosites described by Beckingham and Archibald (1996). It has plant species characteristic of both ecosites. This community type is only moderately productive. Horsetail the principal forage species is generally unpalatable to domestic livestock and can be poisonous to livestock in large amounts (Lodge et al 1968). Consequently, this community type should be rated as secondary or non-use range.

PLANT COMPOSITION

	CANOPY COVER(%) MEAN	RANGE	CONST.
SHRUBS			
WILLOW *(Salix spp.)*	55	-	100
BRACTED HONEYSUCKLE *(Lonicera involucrata)*	19	-	100
ROSE *(Rosa acicularis)*	5	-	100
FORBS			
LINDLEY'S ASTER *(Aster ciliolatus)*	2	-	100
YELLOW AVENS *(Geum macrophyllum)*	11	-	100
COW PARSNIP *(Heracleum lanatum)*	6	-	100
TWINFLOWER *(Linnaea borealis)*	10	-	100
FIELD HORSETAIL *(Equisetum arvense)*	18	-	100
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	28	-	100
SEDGE *(Carex spp)*	4	-	100
FRINGED BROME *(Bromus ciliatus)*	6	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYDRIC

NUTRIENT REGIME: PERMESOTROPHIC

SOIL DRAINAGE: POORLY TO IMPERFECTLY

ELEVATION: 915(818-1205) M

SLOPE:N/A

FORAGE PRODUCTION(KG/HA):N=1

GRASS	130
FORBS	207
SHRUBS	60
TOTAL	397

SUGGESTED GRAZING

NON-USE

c9: Willow-Alder/Fern

(Salix spp.-Alnus crispa/Dryopteris carthusiana)

n=4 This community type was described on north and east facing slopes in the Saddle Hills northwest of Grande Prairie. This community appears to occupy areas that receive some nutrient seepage throughout the growing season. There are some trees growing on these sites, but they are generally restricted to the drier areas. This community is similar to the Alder/Marsh reedgrass community that was described on nutrient rich seepage areas in the Lower Foothills subregion west of Sundre. This community type is very productive, but it is difficult to graze because of the slope and the high cover of alder and willow which restricts livestock movement. This community type should be rated as non-use.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
BALSAM POPLAR (*Populus balsamifera*)	3	0-10	25
SHRUBS			
GREEN ALDER (*Alnus crispa.*)	9	0-35	50
RIVER ALDER (*Alnus tenuifolia*)	42	0-65	75
WILLOW (*Salix bebbiana*)	33	12-65	100
BRACTED HONEYSUCKLE (*Lonicera involcrata*)	16	8-30	100
FORBS			
FIELD HORSETAIL (*Equisetum arvense*)	6	1-9	100
COW PARSNIP (*Heracleum lanatum*)	11	0-33	75
BANEBERRY (*Actaea rubra*)	5	0-15	75
SHIELD FERN (*Dryopteris carthusiana*)	7	0-28	25
OAK FERN (*Gymnocarpium dryopteris*)	1	0-2	25
GRASSES			
FRINGED BROME (*Bromus ciliatus*)	1	0-4	25
MARSH REED GRASS (*Calamagrostis canadensis*)	29	0-74	75

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYDRIC

NUTRIENT REGIME: PERMESOTROPHIC

SOIL DRAINAGE: MODERATELY WELL

ELEVATION: 855(850-860) M

SLOPE: 8(3-12)%

ASPECT: EASTERLY, NORTHERLY

FORAGE PRODUCTION(KG/HA): N=2

GRASS	124(0-248)
FORBS	333(72-594)
SHRUBS	378(84-672)
TOTAL	835(156-1514)

SUGGESTED GRAZING
NON-USE

c10: Willow-Bog birch/Water sedge

(Salix spp.-Betula glandulosa/Carex aquatilis)

n=15 This community type is found along the edges of sedge meadows and in moist depressions. Willow becomes established at the edges of the sedge meadow due to the shorter duration of standing water. Increased flooding and prolonged water logging may result in the disappearance of willow and a transition to a water sedge meadow. As organic matter accumulates these sites dry out, black spruce, tamarack, balsam poplar or paper birch establish (Beckingham 1993). Indeed this process had started to occur on some of described sites. These sites are fairly productive but difficult to graze due to the moist ground conditions and heavy shrub cover which reduces access and mobility within the area. This community type should be rated as non-use.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
BLACK SPRUCE (*Picea mariana*)	2	0-3	33
SHRUBS			
BOG BIRCH (*Betula glandulosa.*)	30	0-91	80
WILLOW (*Salix bebbiana*)	25	0-50	86
FORBS			
FIELD HORSETAIL (*Equisetum arvense*)	1	0-3	33
STRAWBERRY (*Fragaria virginiana*)	2	0-18	33
DWARF RASPBERRY (*Rubus arcticus*)	2	0-13	53
PURPLE AVENS (*Geum rivale*)	2	0-27	27
GRASSES			
WATER SEDGE (*Carex aquatilis*)	22	0-57	80
MARSH REED GRASS (*Calamagrostis canadensis*)	6	0-54	73
BEAKED SEDGE (*Carex rostrata*)	18	0-80	53

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYDRIC

NUTRIENT REGIME: PERMESOTROPHIC

SOIL DRAINAGE: POORLY

ELEVATION: 1108(853-1450)) M

SLOPE: 8(3-12)%

ASPECT: EASTERLY, NORTHERLY

FORAGE PRODUCTION(KG/HA): N=5

GRASS	1631(198-3792)
FORBS	1120(65-3518)
SHRUBS	371(0-744)
TOTAL	3048(1062-4826)

SUGGESTED GRAZING

NON-USE

GRAZED MODIFIED

SHRUBLANDS AND NATIVE GRASSLANDS

OF THE

LOWER FOOTHILLS SUBREGION

Photo 8: A grazed modified native shrub and grassland transition within the Lower Fooothills. The grassland has been modified by grazing, i.e. kentucky bluegrass and clover however the understory of the dense willows has been unchanged due to lack of livestock accessibility.

d1: Kentucky Bluegrass - Timothy/ Veiny Meadow Rue

(Poa pratensis - Phleum pratense/ Thalictrum venulosum)

n=8 This community type results from continued heavy grazing of a Cow parnsip/ Veiny Meadow Rue community type. It will move towards a Kentucky Bluegrass/ Clover - Dandelion community type if the heavy grazing pressure continues.

This community type is considered to be in fair to poor range condition and is generally very productive for domestic livestock, but stocking levels should be reduced on these sites to allow for recovery.

PLANT COMPOSITION

	CANOPY COVER(%) MEAN	RANGE	CONST.
SHRUBS			
SNOWBERRY (*Symphoricarpos occidentalis*)	1	0-6	25
FORBS			
VEINY MEADOW RUE (*Thalictrum venulosum*)	22	0-46	83
DANDELION (*Taraxacum officinale*)	19	5-29	100
AMERICAN VETCH (*Vicia americana*)	7	2-10	100
NORTHERN BEDSTRAW (*Galium boreale*)	6	1-12	100
COMMON YARROW (*Achillea millefolium*)	6	3-9	100
CANADA GOLDENROD (*Solidago canadensis*)	6	0-28	63
COW PARSNIP (*Heracleum lanatum*)	5	0-12	88
FIREWEED (*Epilobium angustifolium*)	4	0-13	63
TALL LARKSPUR (*Delphinium glaucum*)	4	0-17	50
CHICKWEED (*Cerastium arvense*)	3	0-13	50
LINDLEY'S ASTER (*Aster ciliolatus*)	3	0-7	88
CREAM COLOURED VETCHLING (*Lathyrus ochroleucus*)	2	0-3	88
STRAWBERRY (*Fragaria virginiana*)	2	0-4	88
TALL LUNGWORT (BLUEBELLS) (*Mertensia paniculata*)	2	1-4	100
GRASSES			
TIMOTHY (*Phleum pratense*)	13	0-46	63
KENTUCKY BLUEGRASS (*Poa pratensis*)	44	6-77	100
BEAKED SEDGE (*Carex rostrata*)	8	0-20	75
FRINGED BROME GRASS (*Bromus ciliatus*)	7	0-20	63
UPLAND SEDGE (*Carex spp.*)	6	0-27	63
SLENDER WHEAT GRASS (*Agropyron trachycaulum*)	4	0-11	75
SMOOTH BROME GRASS (*Bromus inermis*)	4	0-24	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC TO SUBHYGRIC
NUTRIENT REGIME: PERMESOTROPHIC
SOIL DRAINAGE: MODERATELY WELL
ELEVATION: 1130(1066 - 1176) M
SLOPE: 0 -1%
ASPECT: EASTERLY

FORAGE PRODUCTION(KG/HA): N=1

GRASS	1190
FORBS	614
SHRUBS	1042
TOTAL	2846

SUGGESTED GRAZING
0.4 HA/AUM

d2: Sedge - Kentucky Bluegrass/ Veiny meadow rue

(Carex spp - Poa pratensis/ Thalictrum venulosum)

n=2 This community type has developed from heavy grazing a Sedge/Veiny meadow rue community type, and then resting it for an extended period of time. Heavy prolonged grazing pressure has allowed kentucky bluegrass and dandelion to invade the site. Continued rest has allowed the site to recover and sedge, veiny meadow rue and other native species have increased in cover. Kentucky bluegrass is a very persistent species on these sites and the cover of Kentucky bluegrass will likely remain quite high with continued rest. This community type is considered to be in fair range condition.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	1	0-1	50
SHRUBS			
WILLOW (*Salix bebbiana*)	3	0-5	50
FORBS			
VEINY MEADOW RUE *(Thalictrum venulosum)*	26	25-26	100
DANDELION *(Taraxacum officinale)*	27	24-29	100
NORTHERN BEDSTRAW *(Galium boreale)*	4	1-8	100
COMMON YARROW *(Achillea millefolium)*	7	4-9	100
TALL LARKSPUR *(Delphinium glaucum)*	5	1-8	100
YELLOW AVENS *(Geum aleppicum)*	4	0-8	50
TALL LUNGWORT *(Mertensia paniculata)*	10	7-13	100
AMERICAN VETCH *(Vicia americana)*	7	5-8	100
STRAWBERRY *(Fragaria virginiana)*	3	1-4	100
CREAM COLOURED VETCHLING *(Lathyrus ochroleucus)*	1	0-2	50
GRACEFUL CINQUEFOIL (*Potentilla gracilis)*	1	0-1	50
GRASSES			
BEAKED SEDGE *(Carex rostrata)*	9	0-18	50
KENTUCKY BLUEGRASS *(Poa pratensis)*	8	0-16	50
TIMOTHY *(Phleum pratense)*	2	0-2	50
SMOOTH BROME GRASS *(Bromus inermis)*	5	0-10	50
SLENDER WHEAT GRASS *(Agropyron trachycaulum)*	3	1-5	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC TO SUBHYGRIC

NUTRIENT REGIME: PERMESOTROPHIC

SOIL DRAINAGE: MOD. WELL TO WELL

ELEVATION: 1131(1122-1140) M

SLOPE: 2%

ASPECT: SOUTH

FORAGE PRODUCTION(KG/HA):N=2

GRASS	1369(462-2275)
FORBS	1245(1124-1365)
SHRUBS	2(0-4)
TOTAL	2615(2042-2079)

SUGGESTED GRAZING
0.4 HA/AUM

d3: Green Alder/ Creeping Red Fescue/ Clover

(Alnus crispa/ Festuca rubra/ Trifolium pratense)

n=1 This community type was described on a pipeline that had been seeded to creeping red fescue and clover in a area north of Nojack. Alder, aspen and white birch are slowly invading back onto the right of way. Normally these right of ways are kept free of trees and shrubs. It is likely this area of the pipeline will be sprayed in the near future. These seeded right of ways are very productive and attractive to livestock. Extreme caution must be taken to prevent over-utilization of these sites because they are sometimes the only openings on a lease that is dominated by forest.

PLANT COMPOSITION

	CANOPY COVER(%) MEAN	RANGE	CONST.
TREES			
PAPER BIRCH *(Betula papyrifera)*	4	-	100
SHRUBS			
GREEN ALDER *(Alnus crispa)*	35	-	100
WILLOW *(Salix spp.)*	8	-	100
FORBS			
RED CLOVER *(Trifolium pratense)*	17	-	100
LINDLEY'S ASTER *(Aster ciliolatus)*	5	-	100
PALMATE-LEAVED COLTSFOOT *(Petasites palmatus)*	4	-	100
FIREWEED *(Epilobium angustifolium)*	4	-	100
FIELD HORSETAIL *(Equisetum arvense)*	3	-	100
CREAM-COLORED VETCHLING *(Lathyrus ochroleucus)*	3	-	100
STRAWBERRY *(Fragaria virginiana)*	3	-	100
COMMON YARROW *(Achillea millefolium)*	2	-	100
CANADA GOLDENROD *(Solidago canadensis)*	2	-	100
AMERICAN VETCH *(Vicia americana)*	2	-	100
GRASSES			
CREEPING RED FESCUE *(Festuca rubra)*	43	-	100
MARSH REED GRASS *(Calamagrostis canadensis)*	20	-	100
KENTUCKY BLUEGRASS *(Poa pratensis)*	1	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC

NUTRIENT REGIME: PERMESOTROPHIC

SOIL DRAINAGE: MODERATELY WELL

ELEVATION: 914 M

SLOPE: 5%

ASPECT: NORTH

FORAGE PRODUCTION(KG/HA):N=1

GRASS	2644
FORBS	342
SHRUBS	480
TOTAL	3466

SUGGESTED GRAZING
0.3 HA/AUM

d4: Hazelnut/Cow parsnip/Kentucky bluegrass

(Corylus cornuta/Heracleum lanatum/Poa pratensis)

n=1 This community type occurs in small isolated openings within the aspen dominated forests near Whitecourt Mountain southwest of Whitecourt. This community is similar to the Hazelnut/Wild sarsaparilla community previously described, but it occurs on lower slope positions below the wild sarsaparilla type. The high cover of cow parsnip indicates that this community is richer and moister than the Hazelnut/Wild sarsaparilla type. The presence of Kentucky bluegrass also indicates that this community type has been moderately to heavily grazed in the past. Continued heavy grazing pressure will eventually lead to a decline in all native plant species and this community will likely be dominated by Kentucky bluegrass, timothy, clover and dandelion.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
BALSAM POPLAR (*Populus balsamifera*)	5	-	100
SHRUBS			
HAZELNUT (*Corylus cornuta.*)	10	-	100
ROSE (*Rosa acicularis*)	3	-	100
PIN CHERRY (*Prunus penslyvanica*)	8	-	100
BRACTED HONEYSUCKLE (*Lonicera involucrata*)	7	-	100
FORBS			
WILD STRAWBERRY (*Fragaria virginiana*)	5	-	100
LINDLEY'S ASTER (*Aster ciliolatus*)	4	-	100
SHOWY ASTER (*Aster conspicuus*)	2	-	100
DANDELION (*Taraxacum officinale*)	6	-	100
CLOVER (*Trifolium spp*)	3	-	100
WILD SARSAPARILLA (*Aralia nudicaulis*)	1	-	100
COW PARSNIP (*Heracleum lanatum*)	12	-	100
FIREWEED (*Epilobium angustifolium*)	1	-	100
GRASSES			
KENTUCKY BLUEGRASS (*Poa pratensis*)	19	-	100
HAIRY WILDRYE (*Elymus innovatus*)	4	-	100
PURPLE OATGRASS (*Schizachne purpurascens*)	3	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC

NUTRIENT REGIME: PERMESOTROPHIC

SOIL DRAINAGE: MOD. WELL

ELEVATION: 921 M

SLOPE: 10%

ASPECT: SOUTHERLY

FORAGE PRODUCTION(KG/HA):N=1

GRASS	164
FORBS	1066
SHRUBS	446
TOTAL	1676

SUGGESTED GRAZING
1.1 HA/AUM

d5:Willow/ Kentucky Bluegrass/ Clover

(Salix spp./ Poa pratensis/ Trifolium spp.)

n=9 This community type occurs on the drier edges of wet sedge meadows and Willow - Bog Birch/Sedge or Willow/Marsh reedgrass dominated community types, where it is easy for livestock to access. The heavy grazing regime has favoured the growth of Kentucky bluegrass, clover and dandelion.

PLANT COMPOSITION

	CANOPY COVER(%) MEAN	RANGE	CONST
TREES			
WHITE SPRUCE *(Picea glauca)*	3	0-15	33
SHRUBS			
BOG BIRCH *(Betula glandulosa)*	2	0-18	22
WILLOW *(Salix spp.)*	40	5-90	100
FORBS			
DANDELION *(Taraxacum officinale)*	12	0-30	78
CLOVER *(Trifolium spp.)*	24	0-57	100
VEINY MEADOW RUE *(Thalictrum venulosum)*	7	0-27	89
STAR FLW'D SOLOMON SEAL *(Smilicina stellata)*	6	0-31	56
STRAWBERRY *(Fragaria virginiana)*	3	0-9	89
GRASSES			
FOWL MANNA GRASS *(Glyceria striata)*	4	0-27	22
KENTUCKY BLUEGRASS *(Poa pratensis)*	23	0-85	78
CANADA BLUEGRASS *(Poa compressa)*	9	0-60	33
TUFTED HAIR GRASS *(Deschampsia cespitosa)*	2	0-5	44
TIMOTHY *(Phleum pratense)*	4	0-10	67

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBHYGRIC TO HYGRIC

NUTRIENT REGIME: PERMESOTROPHIC

SOIL DRAINAGE:
MODERATELY WELL TO POORLY

ELEVATION: 835(1054-1260) M

SLOPE: LEVEL

FORAGE PRODUCTION(KG/HA): N=4

GRASS	1325(156-4088)
FORBS	787(558-1218)
SHRUBS	53(0-80)
TOTAL	2165 (1138-4646)

SUGGESTED GRAZING
0.4 HA/AUM

DECIDUOUS FOREST COMMUNITY TYPES

OF THE

LOWER FOOTHILLS SUBREGION

Photo 9: An Aspen-Balsam Poplar/green alder/marsh reed grass community type found on lower slope seepage areas throughout the Lower Foothills Subregion. This community type produces abundant forage but the density of the tall and low shrub layers (alder) can restrict access.

DECIDUOUS FOREST COMMUNITIES

Aspen (*Populus tremuloides* Michx.) and balsam poplar (*Populus balsamifera* L.) make up nearly one-quarter of the 4327 million ovendry tonnes of forest standing crop in the prairie provinces (Bonnor 1985). Deciduous forest communities are also the dominant productive range community types of the Lower Foothills subregion. Six hundred and seventy-six deciduous stands were sampled from 1989 to 1999. These stands fell into three broad groupings, they were the Aspen Community Types, the Aspen-Balsam Poplar - Paper Birch Community Types, and the Aspen Grazed Modified Community Types. This guide separates these three broad groupings.

Aspen is the most widely distributed native tree species in North America (Jones 1985). Alberta alone has over 6.8 million hectares of pure aspen stands which are affected by the multiple use activities of forestry, oil, gas, domestic grazing, wildlife, watershed and recreational use (Wheeler and Willoughby 1993). Over 60% of the 676 deciduous forest stands sampled were grouped into the Aspen Community Types. It would appear the majority of pure aspen stands are found on mesic-medium sites with a productive shrub, forb and grass layer. These community types are generally primary to secondary range on most grazing dispositions within the Lower Foothills.

Balsam poplar and paper birch and are found on moister sites than most Aspen Community Types. Balsam poplar grows best on moist, nutrient-rich, imperfectly-drained, on low-lying ground and paper birch is well adapted to growing on mesic-loamy soils, medium shade tolerance, and is fairly tolerant of nutrient deficits (La Roi 1991). Beckingham (1993) also found that paper birch may prefer to grow on soils with a lower pH (<5.3).

Aspen Grazed Modified Community Types represent Aspen community types that have undergone moderate to heavy historic grazing regimes. Overall, as grazing pressure increases, the canopy cover in the shrub and forb layer declines and there is an increase in low forbs. When grazing pressure becomes severe, native plant species are replaced by non-native invaders (Willoughby 1995).

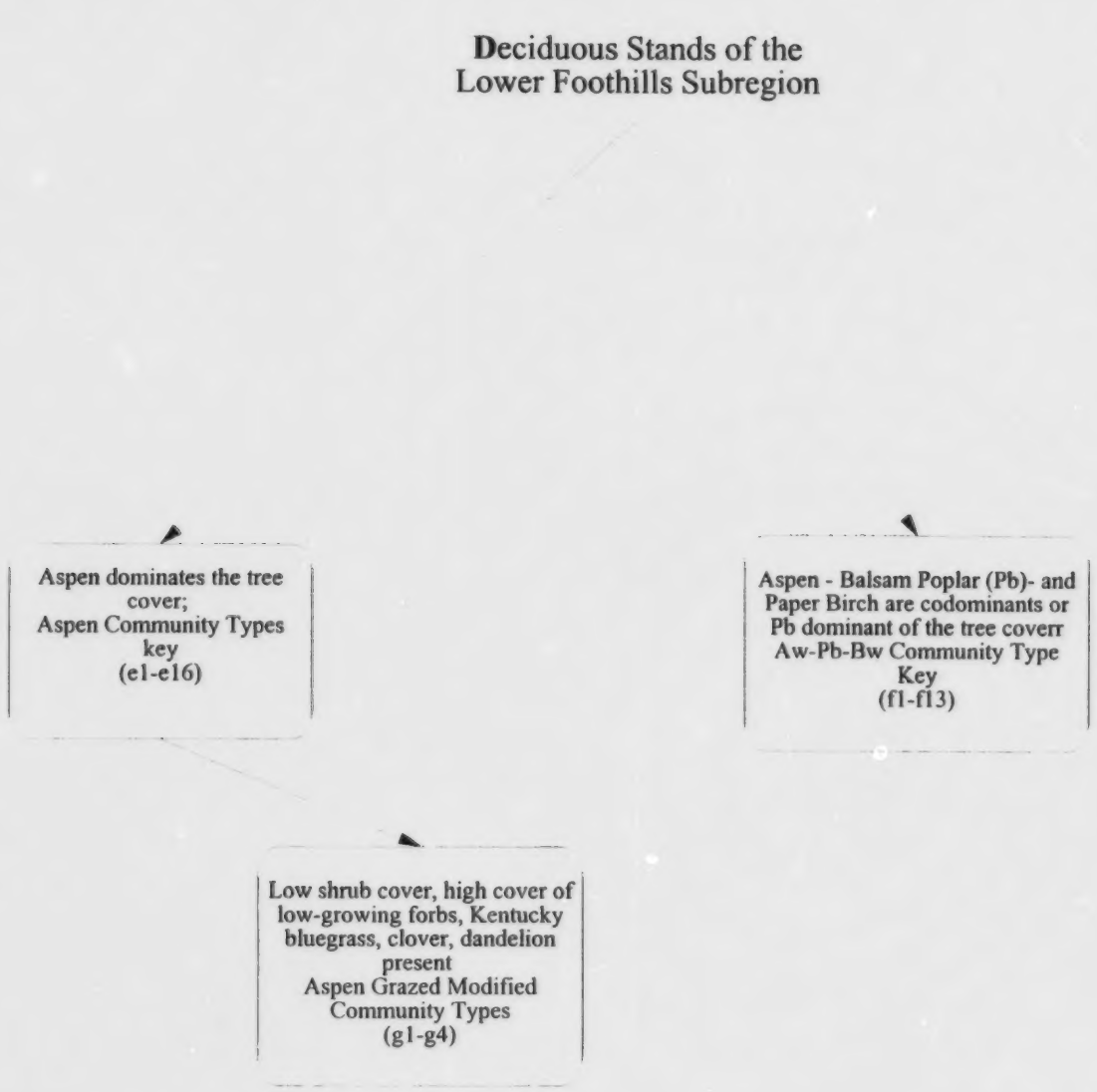

Deciduous Stands of the
Lower Foothills Subregion
Aspen dominates the tree cover;
Aspen Community Types key
(e1-e16)
Aspen - Balsam Poplar (Pb)- and Paper Birch are codominants or Pb dominant of the tree coverr
Aw-Pb-Bw Community Type Key
(f1-f13)
Low shrub cover, high cover of low-growing forbs, Kentucky bluegrass, clover, dandelion present
Aspen Grazed Modified Community Types
(g1-g4)

Figure 6: Key to the deciduous community types within the Lower Foothills Subregion

ASPEN COMMUNITY TYPES

OF THE

LOWER FOOTHILLS SUBREGION

Photo 10: A typical Aspen/ Rose - Low-bush cranberry/ Tall forb community type within the Lower Foothills subregion. This community type is sensitive to grazing and only occurs on sites that are ungrazed or have a history of very light grazing. This community type produces high amounts of palatable forage and is considered to be in excellent range conidition.

Ecology of the Aspen Community Types of the Lower Foothills subregion

Over 60% of the 676 deciduous forest stands sampled in 1990-1999 in the Lower Foothills subregion, were classified into Aspen community types. Within the Lower Foothills aspen ranges from submesic to hygric moisture regimes, with medium to rich nutrient regimes (Beckingham et al 1996). However the modal site conditions are well-drained, mesic-medium dominated by Aw/Rose - Low-bush Cranberry/Tall Forb community type. Prickly rose seems to be a dominant, co-dominant, or subdominant shrub in most aspen stands sampled within this guide. It is believed that prickly rose is an extremely adapted species with a diverse rooting medium that can occupy and array of site and disturbance conditions. Plot sampling for this guide was primarily within crown land grazing dispositions, thereby the presence of rose maybe an indicator of grazing influences, where as less tolerant species such as low-bush cranberry and wild sarsaparilla seem to be sensitive to any grazing pressure. The effects of further grazing pressure is illustrated in the Aspen Grazed Modified Community Types.

Other shrub and forb species are indicative of specific site conditions along slope gradients (Figure7). The blueberrry and bearberry dominated community types are indicative of dry, well drained sites, on sandy and coarse textured soils. The rose-twin-flower (low forb) type appears to be slightly drier with poorer nutrients than the rose-tall forb dominated type, but the dominanace of low forbs over tall forbs may also indicate increased grazing pressure. The Aw/buffaloberry type has a similar moisture regime to the Aw/rose types, but appears to be found on sites with poorer nutrient regimes with a lower pH (Beckingham 1993). Aw/hazelnut, Aw/white meadowsweet, and Aw/saskatoon appear on similar mesic topographic positions but are affected by specific site conditions.

Further down slope are community types associated with moderately well drained moist-rich adapted species. The Aw/alder dominated types are found on moister sites, although it can be found on upland sites where there is an impermeable soil layer which entraps soil moisture e.g. Aw/alder/marsh reed grass/hairy wild rye. Aw/bracted honeysuckle are also associated with mid to lower sloped subhygric-rich sites and is often associated with balsam poplar. The oak fern and horsetail types are found on moist, nutrient rich sites and seepage areas. The snowberry type is found on well drained sites overlooking rivers and streams. Thimbleberry is commonly found within the Montane Subregion but has been found on nutrient rich seepage areas along river flats. Aw/willow is found on low-lying subhygric to hygric-rich sites in close association with other indicator shrubs such as honeysuckle, and dogwood.

Table 7. Forage production summary for aspen community types within the Lower Foothills subregion

	Community number	Community type	Productivity (kg/ha)				sample size (n)	Carrying capacity (ha/AUM)
			Grass	Forb	Shrub	Total		
c hairy wild rye submesic/ medium	**Ecosite phase**	**c2 hairy wild rye Aw**	**339**	**431**	**190**	**960**	**7**	**1.9**
	e1	Aw/blueberry	339	459	198	996	6	1.8
	e2	Aw/bearberry/fringed brome	339	263	145	747	1	2.4
	Ecosite phase	**c2_grazed Aw**	**58**	**282**	**34**	**374**	**2**	**4.8**
	g1	Aw/rose/hairy wild rye/clover	58	282	34	374	2	4.8
e low-bush cranberry mesic/ medium	**Ecosite phase**	**e2 low-bush cranberry Aw**	**275**	**435**	**206**	**917**	**116**	**2.0**
	e3	Aw/buffalo-berry	222	479	182	883	16	2.1
	e4	Aw/saskatoon	178	203	239	620	3	2.9
	e5	Aw/alder	260	404	198	861	27	2.1
	e6	Aw/alder/marsh reedgrass-hairy wild rye	264	512	113	889	3	2.0
	e7	Aw/rose-low-bush cranberry/tall forbs	321	460	177	957	34	1.9
	e8	Aw/rose-twinflower	247	366	235	848	15	2.1
	e9	Aw/snowberry	408	580	408	1396	2	1.3

Community number	Community type	Productivity (kg/ha)				sample size (n)	Carrying capacity (ha/AUM)
		Grass	Forb	Shrub	Total		
e10	Aw/white meadowsweet	274	584	100	959	6	1.9
e11	Aw/beaked hazelnut/wild sarsaparilla	346	428	465	1240	6	1.5
Ecosite phase	**e2_grazed Aw**	**412**	**370**	**162**	**944**	**75**	**2.0**
g2	Aw/rose/strawberry	356	360	182	898	44	2.0
g3	Aw/rose/clover	154	414	152	720	13	2.5
g4	Aw/kentucky bluegrass/clover	681	380	117	1178	18	2.0
Ecosite phase	**e2_harvest Aw**	**766**	**803**	**516**	**2084**	**16**	**2.0**
l5	Aw/marsh reedgrass/rose/firweed	767	844	543	2154	15	2.0
l6	raspberry/marsh reedgrass/Aw	n/a	n/a	n/a	n/a	0	2.0
l7	beaked hazelnut/Aw/wild sarsaparilla	742	190	104	1036	1	2.0
Ecosite phase	**e2_harvest_grazed Aw**	**834**	**382**	**202**	**1418**	**9**	**2.0**
m2	Aw/buffalo-berry/clover	n/a	n/a	n/a	n/a	0	2.0
m3	strawberry-clover/rose/marsh reedgrass	405	331	541	1277	3	2.0

	Community number	Community type	Productivity (kg/ha)				sample size (n)	Carrying capacity (ha/AUM)
			Grass	Forb	Shrub	Total		
	m4	kentucky bluegrass/clover-dandelion	1048	408	33	1489	6	2.0
f bracted honeysuckle subhygric/ rich	**Ecosite phase**	**f2 bracted honeysuckle Aw-Pb**	**365**	**532**	**316**	**1244**	**138**	**1.5**
	e12	Aw/bracted honeysuckle	270	419	135	824	3	2.2
	e13	Aw/thimbleberry	71	195	469	735	3	2.5
	e14	Aw/oak fern	0	218	148	366	1	5.0
	e15	Aw/willow	174	390	167	731	6	2.5
	Ecosite phase	**f2_harvest**	**1733**	**1117**	**175**	**4008**	**3**	**1.5**
	l10	Aw/bracted honeysuckle/horsetail	n/a	n/a	n/a	n/a	0	1.5
i horsetail hygric/rich	**Ecosite phase**	**i1 horsetail Pb-Aw**	**406**	**536**	**319**	**1260**	**6**	**1.4**
	e16	Aw/rose/horsetail	406	536	319	1260	6	1.4

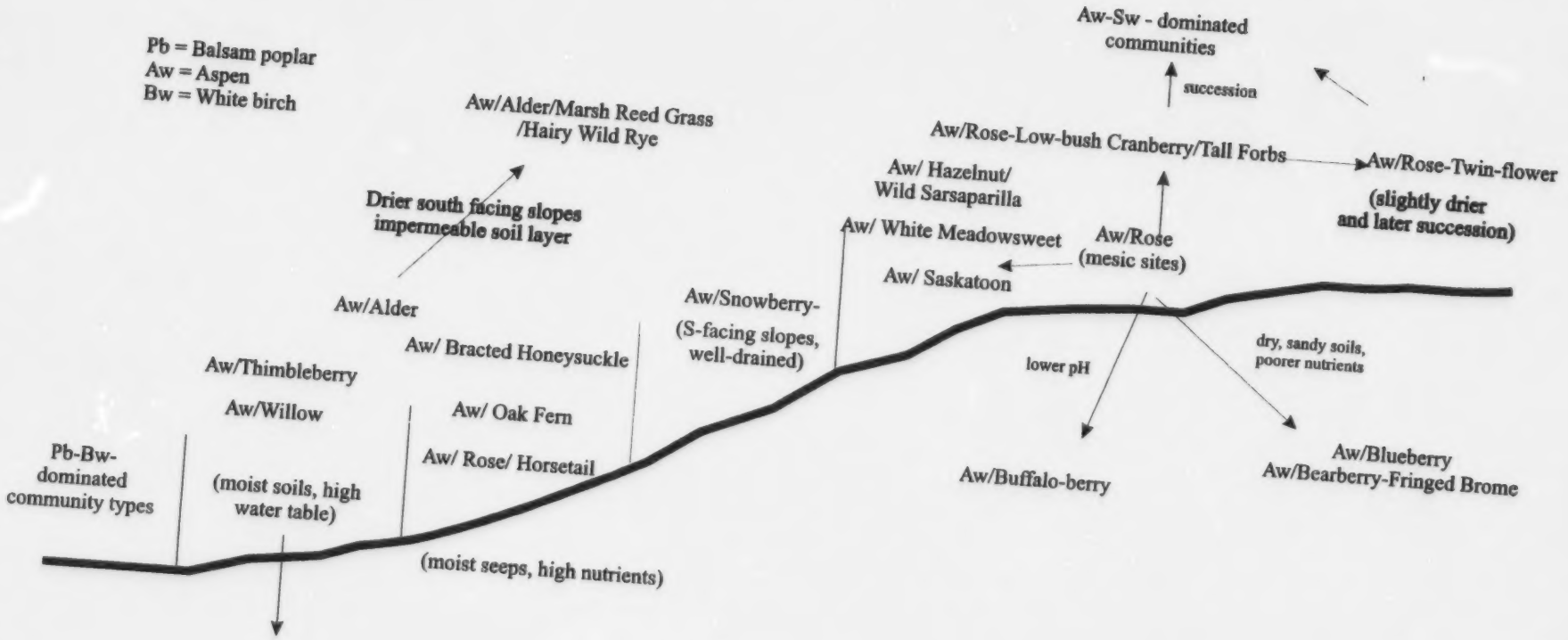


Figure 9: Landscape profile of Aspen community types of the Lower Foothills Subregion

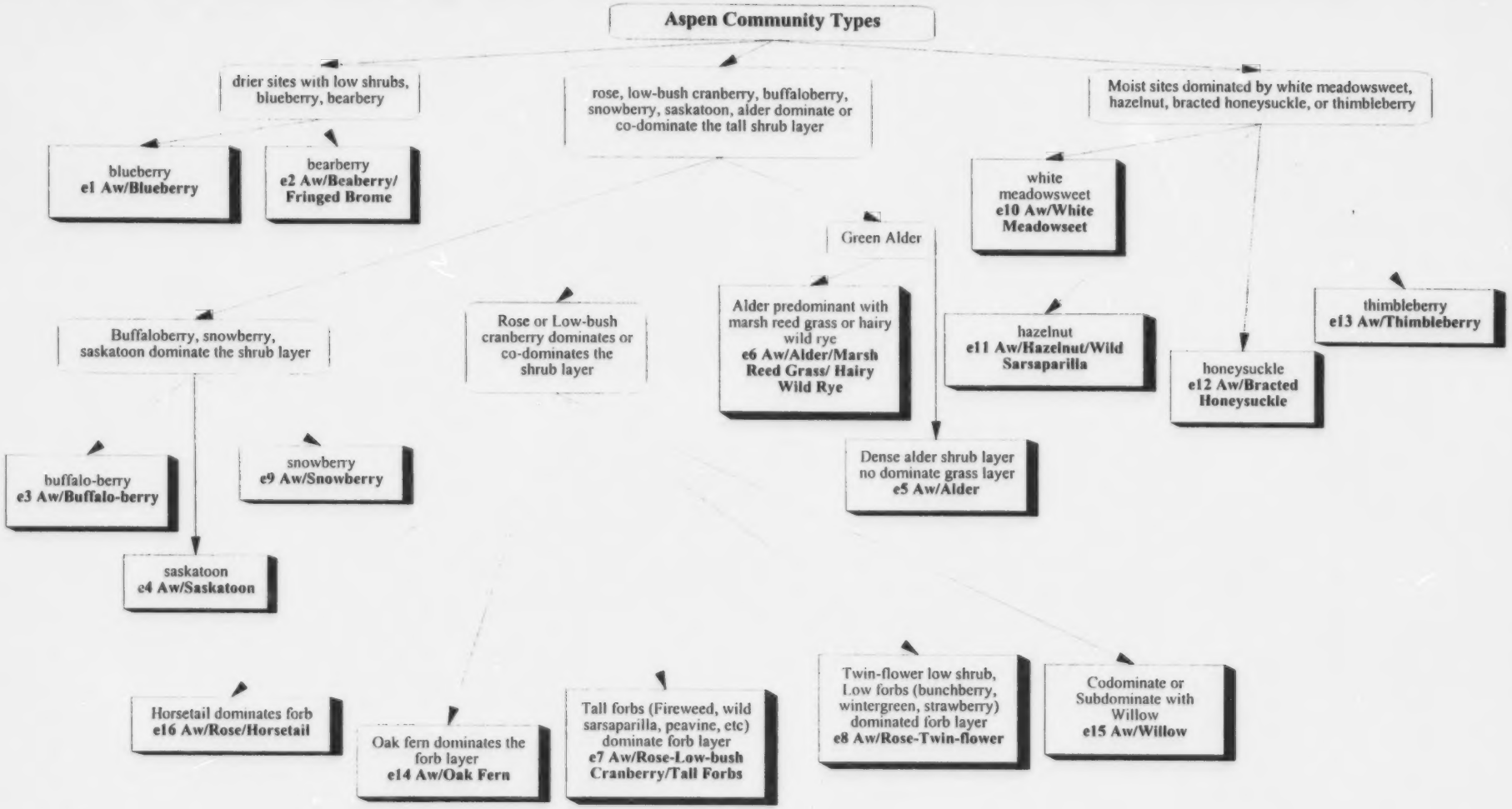

Aspen Community Types
drier sites with low shrubs, blueberry, bearbery
rose, low-bush cranberry, buffaloberry, snowberry, saskatoon, alder dominate or co-dominate the tall shrub layer
Moist sites dominated by white meadowsweet, hazelnut, bracted honeysuckle, or thimbleberry
blueberry e1 Aw/Blueberry
bearberry e2 Aw/Beaberry/ Fringed Brome
white meadowsweet e10 Aw/White Meadowseet
Green Alder
Buffaloberry, snowberry, saskatoon dominate the shrub layer
Rose or Low-bush cranberry dominates or co-dominates the shrub layer
Alder predominant with marsh reed grass or hairy wild rye e6 Aw/Alder/Marsh Reed Grass/ Hairy Wild Rye
hazelnut e11 Aw/Hazelnut/Wild Sarsaparilla
thimbleberry e13 Aw/Thimbleberry
honeysuckle e12 Aw/Bracted Honeysuckle
buffalo-berry e3 Aw/Buffalo-berry
snowberry e9 Aw/Snowberry
Dense alder shrub layer no dominate grass layer e5 Aw/Alder
saskatoon e4 Aw/Saskatoon
Horsetail dominates forb e16 Aw/Rose/Horsetail
Oak fern dominates the forb layer e14 Aw/Oak Fern
Tall forbs (Fireweed, wild sarsaparilla, peavine, etc) dominate forb layer e7 Aw/Rose-Low-bush Cranberry/Tall Forbs
Twin-flower low shrub, Low forbs (bunchberry, wintergreen, strawberry) dominated forb layer e8 Aw/Rose-Twin-flower
Codominate or Subdominate with Willow e15 Aw/Willow

Figure 10: Key to the Aspen Community Types for the Lower Foothills Subregion

e1: Aspen/ Blueberry

(Populus tremuloides/ Vaccinium myrtilloides)

n=15 This community type is similar to Aspen/blueberry/hairy wild rye described by Beckingham et al (1996). This community type is dominated by blueberry and other shrub species (bog cranberry and labrador tea) adapted to drier well-drained sites compared to the modal mesic/medium low-bush cranberry ecosites. This may succeed to a White Spruce dominated sites, however the transition is slow due to the dry site conditions (Beckingham et al 1996).

This community type tends to be open and accessible to livestock. Forage production is moderate (n=6 production clippings --- with additional clippings production will likely decline), but the majority of the species are not preferred by livestock and therefore this community type will only be used after other, more preferred sites are degraded. This community type should be rated as secondary range for domestic livestock.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	55	21-80	100
WHITE SPRUCE *(Picea glauca)*	3	2-15	47
SHRUBS			
ROSE *(Rosa acicularis)*	5	0-12	93
BLUEBERRY OR WHORTLEBERRY *(Vaccinium myrtilloides)*	12	0-34	80
LABRADOR TEA (*Ledum groenlandicum*)	5	0-19	60
BOG CRANBERRY (*Vaccinium vitis-idaea*)	3	0-25	47
RASPBERRY *(Rubus idaeus)*	3	0-14	47
LOW-BUSH CRANBERRY (*Viburum edule*)	3	0-7	40
BUFFALO-BERRY *(Shepherdia canadensis)*	2	0-3	40
FORBS			
STRAWBERRY *(Fragaria virginiana)*	5	1-12	100
BUNCHBERRY *(Cornus canadensis)*	8	0-28	93
WILD LILY OF THE VALLEY *(Maianthemum canadense)*	2	1-7	93
CREAM-COLOURED VETCHLING *(Lathyrus ochroleucus)*	5	1-13	87
COMMON PINK WINTERGREEN *(Pyrola asarifolia)*	2	0-10	80
PALMATED COLTSFOOT *(Petasites palmatus)*	2	0-8	73
LINDLEY'S ASTER (*Aster ciliolatus*)	2	0-6	73
NORTHERN BEDSTRAW (*Galium boreale*)	1	0-3	73
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	8	0-25	80
HAIRY WILD RYE *(Elymus innovatus)*	5	0-19	73
PURPLE OAT GRASS (*Schizachne purpurascens*)	1	0-3	47

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBMESIC TO MESIC
NUTRIENT REGIME: MESOTROPHIC
SOIL DRAINAGE: WELL
ELEVATION: 824 - 1143 M (1005 M)
SLOPE: 5 - 7 %
ASPECT: SOUTH-EASTERLY

FORAGE PRODUCTION KG/HA N=6

GRASS 339 (157-546)
FORBS 459 (75-1014)
SHRUBS 198 (0-642)
TOTAL 996 (411-1528)

SUGGESTED GRAZING
1.8 HA/AUM

e2: Aspen/ Bearberry/ Fringed Brome

(Populus tremuloides/ Arctostaphylos uva-ursi/ Bromus ciliatus)

n=2 This community type is similar to the Aw/Bearberry type described by Beckingham (1993). It is found in conjunction with lodgepole pine on dry, well drained sites. Beckingham found that the combination of lighter textured parent material and rapid drainage due to topographic position resulted in a site type that is drier than the modal aspen type. The presence of labrador tea and blueberry in this communiy type indicate that this type is similar to the blueberry- dominated community types. The high amount of fringed brome in this community type indicates that this site is more nutrient rich than the other blueberry-dominated community types.

This community type is usually easily accessible to livestock, but the dry site conditions and poorer nutrient staus limit the amount of regrowth after grazing. If this community type is managed for one rotation per year it can contribute to the productivity of a lease.

PLANT COMPOSITION	CANOPY COVER(%)		
	MEAN	RANGE	CONST.
TREES			
ASPEN			
(Populus tremuloides)	41	35-47	100
LODGEPOLE PINE			
(Pinus contorta)	3	0-6	50
WHITE SPRUCE			
(Picea glauca)	3	0-6	50
SHRUBS			
BEARBERRY			
(Arctostaphylos uva-ursi)	18	16-20	100
ROSE			
(Rosa acicularis)	14	5-22	100
LABRADOR TEA			
(Ledum groenlandicum)	5	0-9	50
BLUEBERRY			
(Vaccinium myrtilloides)	4	0-7	50
BUFFALO-BERRY			
(Shepherdia canadensis)	3	0-5	50
FORBS			
STRAWBERRY			
(Fragaria virginiana)	14	7-20	100
BUNCHBERRY			
(Cornus canadensis)	8	0-15	50
COMMON PINK WINTERGREEN			
(Pyrola asarifolia)	8	0-15	50
CREAM-COLOURED VETCHLING (PEAVINE)			
(Lathyrus ochroleucus)	7	1-13	100
FIREWEED			
(Epilobium angustifolium)	7	3-10	100
AMERICAN VETCH			
(Vicia americana)	5	3-6	100
DEWBERRY OR RUNNING RASPBERRY			
(Rubus pubescens)	4	0-8	50
NORTHERN BEDSTRAW			
(Galium boreale)	3	3	100
COMMON YARROW			
(Achillea millefolium)	2	2	100
GRASSES			
FRINGED BROME GRASS			
(Bromus ciliatus)	11	3-18	100
MARSH REED GRASS			
(Calamagrostis canadensis)	3	1-5	100
SLENDER WHEATGRASS			
(Agropyron trachycaulum)	2	0-4	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBMESIC

NUTRIENT REGIME: MESOTROPHIC

SOIL DRAINAGE: WELL

ELEVATION: 973 - 1215 M

SLOPE: 4 - 30%

ASPECT: SOUTHERLY

FORAGE PRODUCTION IN KG/HA N=1

GRASS	339
FORBS	263
SHRUBS	145
TOTAL	747

SUGGESTED GRAZING
2.4 HA/AUM

e3: Aspen/ Buffalo-berry

(Populus tremuloides/ Shepherdia canadensis)

n=22 This aspen community type is dominated by an understory of buffalo-berry. Beckingham (1994) described a similar community type (Aw/Buffalo-berry). This type had vegetative affinities with the Aw/Rose-Low Bush Cranberry/Tall Forb type due to the common mesic substrate characteristics, but the buffalo-berry type was slightly drier, acidic (pH 5.3) and nutrient poor.

This community type is not as productive as other mesic/medium Aspen types, because the understory is dominated by buffalo-berry which is not palatable to cattle. Therefore, this community type is rated as secondary range.

PLANT COMPOSITION	CANOPY COVER(%) MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	45	15-80	100
BALSAM POPLAR *(Populus balsamifera)*	3	0-18	44
WHITE SPRUCE (*Picea glauca*)	2	0-12	39
SHRUBS			
BUFFALO-BERRY *(Shepherdia canadensis)*	17	9-34	100
ROSE *(Rosa acicularis)*	13	5-30	100
LOW-BUSH CRANBERRY *(Viburum edule)*	5	0-19	77
SASKATOON *(Amelanchier alnifolia)*	2	0-8	46
WILLOW *(Salix spp.)*	2	0-10	46
WHITE MEADOWSWEET (*Spiraea betulifolia*)	3	0-17	41
FORBS			
WILD STRAWBERRY *(Fragaria virginiana)*	6	0-17	96
BUNCHBERRY (*Cornus canadensis*)	13	0-24	91
CREAM-COLOURED VETCHLING *(Lathyrus ochroleucus)*	5	0-21	91
COMMON PINK WINTERGREEN (*Pyrola asarifolia*)	6	0-16	86
LINDLEY'S ASTER *(Aster ciliolatus)*	4	0-13	86
NORTHERN BEDSTRAW *(Galium boreale)*	2	0-5	86
AMERICAN VETCH *(Vicia americana)*	2	0-6	86
FIREWEED (*Epilobium angustifolium*)	4	0-8	73
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	5	0-14	82
HAIRY WILD RYE (Elymus innovatus)	6	0-33	59
FRINGED BROME GRASS *(Bromus ciliatus)*	2	0-20	27

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: MESOTROPHIC

SOIL DRAINAGE: WELL

ELEVATION: 677 -1050 M (828 M)

SLOPE: 5 - 7 %

ASPECT: SOUTH-EASTERLY

FORAGE PRODUCTION KG/HA N=16

GRASS	222 (24-514)
FORBS	479 (172-770)
SHRUBS	182 (86-350)
TOTAL	883 (488-1312)

SUGGESTED GRAZING
2.1 HA/AUM

e4: Aspen/Saskatoon

(Populus tremuloides/Amelanchier alnifolia)

n=4 This community type is found on well-drained sites with a medium nutrient regime as indicated by the abundance of rose and snowberry. When saskatoon dominates the understory, it usually occurs on south and west-facing slopes (Willoughby et al 1996), although in the Lower Foothills it seems to occur on fluvial terraces or slopes. Saskatoon provides important browse for wild ungulates. Livestock also find saskatoon palatable, and in areas where there is extensive cattle grazing, this species can be heavily browsed.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
ASPEN			
(Populus tremuloides)	55	40-70	100
PAPER BIRCH			
(*Betula papyrifera*)	7	0-20	50
SHRUBS			
SASKATOON			
(Amelanchier alnifolia)	11	6-16	100
ROSE			
(*Rosa acicularis*)	5	0-13	75
SNOWBERRY OR BUCKBRUSH			
(Symphoricarpos occidentalis)	3	0-7	50
BUFFALO-BERRY			
(Shepherdia canadensis)	1	0-4	50
FORBS			
DEWBERRY OR RUNNING RASPBERRY			
(Rubus pubescens)	5	1-13	100
STRAWBERRY			
(Fragaria virginiana)	5	2-8	100
WILD LILY OF THE VALLEY			
(*Maianthemum canadense*)	1	1	100
TALL LUNGWORT (BLUEBELLS)			
(Mertensia paniculata)	3	3-4	75
CREAM-COLORED VETCHLING			
(Lathyrus ochroleucus)	2	1-4	75
COMMON PINK WINTERGREEN			
(Pyrola asarifolia)	1	1-2	75
BUNCHBERRY			
(Cornus canadensis)	3	0-9	50
LINDLEY'S ASTER			
(*Aster ciliolatus*)	3	0-9	50
GRASSES			
MARSH REED GRASS			
(Calamagrostis canadensis)	5	0-9	75
SEDGES			
(Carex spp.)	5	0-10	50
HAIRY WILD RYE			
(*Elymus innovatus*)	2	0-7	25
MOSSES			
(Moss spp.)	30	0-99	75

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC
NUTRIENT REGIME: MESOTROPHIC
SOIL DRAINAGE: WELL
ELEVATION: 1085 M
SLOPE: 3-15 %
ASPECT: SOUTHERLY

FORAGE PRODUCTION IN KG/HA: N=3

GRASS	178 (54-331)
FORBS	203 (50-457)
SHRUBS	239 (171-295)
TOTAL	620 (450-959)

SUGGESTED GRAZING
2.9 HA/AUM

e5: Aspen/ Alder

(Populus tremuloides/ Alnus crispa)

n=52 This community type is generally found at low to mid slope elevations on sites with northerly aspects. It tends to be dominated by green alder in the tall shrub layer and rose & raspberry in the low shrub layer. Wild sarsaparilla dominates the forb layer. EMA (1993) described a similar community type (Aw(Pb)/Green Alder/Wild Sarsaparilla) throughout the Low Boreal Cordilleran ecoregion. They found this type on well drained Orthic Grey Luvisols and Eutric Brunisols (Balsam poplar occurred as a codominant in the overstory on imperfectly drained, luvisolic Gleysols).

Wild Sarsaparilla is well adapted to undisturbed, moist to shaded forests with medium to rich nutrient regimes (MacKinnon et al 1992). The absence of wild sarsaparilla, even though a similar moisture regime is present, may indicate a difference in soil nutrient levels or an intolerance to light-moderate grazing regimes.

There is only a moderate amount of forage being produced for domestic livestock in this community type because most of the production is coming from green alder and wild sarsaparilla which are not palatable to cattle. Consequently, this community type would be rated as secondary or non-use range.

PLANT COMPOSITION

	CANOPY COVER(%) MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	50	05-85	100
BALSAM POPLAR (*Populus balsamifera*)	3	0-20	44
SHRUBS			
GREEN ALDER *(Alnus crispa)*	31	5-75	100
ROSE *(Rosa acicularis)*	10	0-31	100
LOW BUSH CRANBERRY *(Viburnum edule)*	7	0-30	83
RASPBERRY *(Rubus idaeus)*	5	0-30	67
WHITE MEADOWSWEET (*Spiraea betulifolia*)	4	0-19	56
WILLOW (*Salix spp.*)	6	0-15	50
BRACTED HONEYSUCKLE (*Lonicera involucrata*)	4	0-20	48
FORBS			
BUNCHBERRY *(Cornus canadensis)*	8	0-65	94
FIREWEED *(Epilobium angustifolium)*	5	0-26	89
COMMON PINK WINTERGREEN (*Pyrola asarifolia*)	3	0-10	87
STRAWBERRY *(Fragaria virginiana)*	4	0-20	83
CREAM-COLORED VETCHLING *(Lathyrus ochroleucus)*	3	0-16	81
WILD LILY-OF-THE-VALLEY *(Maianthemum canadense)*	2	0-7	75
WILD SARSAPARILLA *(Aralia nudicaulis)*	11	0-40	73
TALL LUNGWORT *(Mertensia paniculata)*	3	0-12	68
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	8	0-30	85
HAIRY WILD RYE *(Elymus innovatus)*	5	0-21	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC TO SUBHYGRIC
NUTRIENT REGIME: MESOTROPHIC TO PERMESOTROPHIC
SOIL DRAINAGE: MODERATELY WELLTO WELL
ELEVATION: 597 - 1478 M (974 M)
SLOPE: 0 - 15 %
ASPECT: NORTH -EASTERLY

FORAGE PRODUCTION IN KG/HA: N=27

GRASS	260 (24-1032)
FORBS	404 (80-956)
SHRUBS	198 (0-712)
TOTAL	861 (396-1571)

SUGGESTED GRAZING
2.1 HA/AUM

e6: Aspen/ Alder/ Marsh Reed Grass/ Hairy Wild Rye

(Populus tremuloides/ Alnus crispa/Calamagrostis canadensis - Elymus innovatus)

n=3 This community type is very similar to the previous (Aw/Alder) community type, but is found on higher elevation, slightly drier, well-drained, south facing slopes and indicated by the presence of bearberry, and hairy wild rye. The presence of alder maybe due to an impermeable soil layer which creates higher soil moisture for alder shrubs.

The forage production in this community type is very similar to the previous type, however, the lower predmoninance of alder creates and open understory for livestock distribution. The majority of the production is coming from grass and forbs consequently, this community type is either primary or secondary range depending on its proximity and relative characteristics of other adjacent community types.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	42	25-60	100
SHRUBS			
GREEN ALDER *(Alnus crispa)*	14	9-17	100
WHITE MEADOWSWEET *(Spiraea betulifolia)*	4	3-4	100
ROSE *(Rosa acicularis)*	2	0-5	67
BEARBERRY *(Arctostaphylos uva-ursi)*	2	0-4	67
FORBS			
FIREWEED *(Epilobium angustifolium)*	8	2-21	100
BUNCHBERRY (*Cornus canadensis*)	8	3-17	100
CREAM-COLOURED VETCHLING (*Lathyrus ochroleucus*)	5	1-12	100
STRAWBERRY *(Fragaria virginiana)*	2	1-2	100
WILD SARSAPARILLA (*Aralia nudicaulis)*	9	0-17	67
SMOOTH ASTER *(Aster laevis)*	3	0-6	67
AMERICAN VETCH *(Vicia americana)*	2	0-5	67
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	26	14-38	100
HAIRY WILD RYE *(Elymus innovatus)*	25	16-33	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: MESOTROPHIC

SOIL DRAINAGE: WELL

ELEVATION: 1240 - 1310 M

SLOPE: 12 - 35 %

ASPECT: SOUTHERLY

FORAGE PRODUCTION IN KG/HA N=3

GRASS	264 (55-484)
FORBS	512 (44-1128)
SHRUBS	113 (12-306)
TOTAL	889 (120-1918)

SUGGESTED GRAZING
2.0 HA/AUM

e7: Aspen/ Rose - Low-bush Cranberry/ Tall Forbs

(Populus tremuloides/ Rosa acicularis- Viburum edule/ Tall Forbs*)*

n=52 This community type appears to be the modal aspen type on mesic well to moderately well drained, nutrient medium to rich, undisturbed sites. Beckingham et al (1996) described a similar community type (Aw/Low Bush Cranberry). This community type is also similar to the Aw/Rose/Strawberry community type, but a high cover of tall growing forbs (ie. wild sarsaparilla, fireweed, and vetchling) distinguishes this type from the low forb type. Presently it is unclear why there is a difference in the forb layers between the tall and low forb types. Corns and Annas (1986) felt that wild sarsaparilla grows under moist, nutrient rich conditions; which may help to explain the difference between the two types. Wild sarsaparilla is also sensitive to disturbance and grazing may cause the tall forb layer to become sparse.

Those Aw/Rose-Low-bush Cranberry/Tall forb community type without wild sarsaparilla, but with plenty of fireweed may exist on slightly drier sites with poorer nutrient regimes than those abundant in wild sarsaparilla. Later seral stages will likely succeed to a mixed Aw-Sw/rose/forb type and climax to an Sw/moss dominated community.

This community type has good forage production and the tall forb layer is highly palatable to cattle. This community type is primary range for domestic livestock.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	57	20-95	100
BALSAM POPLAR *(Populus balsamifera)*	3	0-15	40
SHRUBS			
ROSE *(Rosa acicularis)*	15	1-42	100
LOW BUSH CRANBERRY *(Viburnum edule)*	8	0-50	75
RASPBERRY *(Rubus idaeus)*	6	0-28	68
WHITE MEADOWSWEET *(Spiraea betulifolia)*	3	0-12	45
BRACTED HONEYSUCKLE *(Lonicera involucrata)*	2	0-21	44
FORBS			
WILD SARSAPARILLA *(Aralia nudicaulis)*	14	0-60	71
CREAM-COLOURED VETCHLING *(Lathyrus ochroleucus)*	6	0-20	99
BUNCHBERRY *(Cornus canadensis)*	7	0-20	92
STRAWBERRY *(Fragaria virginiana)*	4	0-14	90
FIREWEED *(Epilobium angustifolium)*	8	0-25	85
DEWBERRY OR RUNNING RASPBERRY *(Rubus pubescens)*	3	0-13	78
TALL LUNGWORT *(Mertensia paniculata)*	4	0-21	74
LINDLEY'S ASTER *(Aster ciliolatus)*	3	0-25	60
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	8	0-38	94
HAIRY WILD RYE *(Elymus innovatus)*	4	0-27	67

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC- SUBHYGRIC
NUTRIENT REGIME: MESOTROPHIC TO PERMESOTROPHIC
SOIL DRAINAGE: MODERATELY WELL TO WELL
ELEVATION: 686 -1300 M
SLOPE: 0 - 15%
ASPECT: NORTHERLY

FORAGE PRODUCTION IN KG/HA N=34

GRASS	321 (2-1817)
FORBS	460 (86-959)
SHRUBS	177 (0-560)
TOTAL0	957 (202-2776)

SUGGESTED GRAZING
1.9 HA/AUM

e8: Aspen/ Rose - Twinflower

(Populus tremuloides/ Rosa acicularis - Linnaea borealis)

n=30 This community type occupies mesic, well drained sites, with medium nutrient regimes. It is similar to the Aw/Rose type described by Beckingham (1996) and the Aw/Rose-Low-bush cranberry/Tall Forbs c.t. described previously, but it appears to be found on slightly drier sites that have poorer nutrient regimes (buffalo-berry). It is felt that this community type may be at a later successional stage (Sw) as the tall forbs are predmominated by low forbs such as bunchberry, strawberry, and common pink wintergreen. This will succeed to a mixed Aw-Sw/rose/forb and eventually to a Sw/moss c.t.

This community type may also be formed after light to moderate grazing an Aw/Rose-Low-bush cranberry/Tall Forbs community type. Moderate grazing appears to graze out the taller growing forbs and allow the lower growing forbs to proliferate.

Forage production is good in this community type, but the low growing forbs are not as accessible to livestock or productive as the tall growing forbs. This community type is still considered to be secondary range.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	57	20-80	100
WHITE SPRUCE (*Picea glauca*)	5	0-15	70
BALSAM POPLAR *(Populus balsamifera)*	3	0-20	43
SHRUBS			
ROSE *(Rosa acicularis)*	13	2-26	100
TWIN-FLOWER *(Linnaea borealis)*	9	2-20	100
LOW BUSH CRANBERRY *(Viburnum edule)*	4	0-20	87
BUFFALO-BERRY (*Sheperdia canadensis*)	3	0-10	53
RASPBERRY *(Rubus idaeus)*	3	0-9	53
FORBS			
BUNCHBERRY *(Cornus canadensis)*	11	0-25	97
STRAWBERRY *(Fragaria virginiana)*	4	0-10	97
COMMON PINK WINTERGREEN *(Pyrola asarifolia)*	3	0-8	97
WILD LILY OF THE VALLEY (*Maianthemum canadense*)	3	0-10	93
CREAM-COLOURED VETCHLING *(Lathyrus ochroleucus)*	5	0-37	90
DEWBERRY OR RUNNING RASPBERRY *(Rubus pubescens)*	3	0-11	87
LINDLEY'S ASTER (*Aster ciliolatus*)	3	0-8	73
FIREWEED *(Epilobium angustifolium)*	3	0-10	73
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	6	0-26	87
HAIRY WILD RYE *(Elymus innovatus)*	6	0-18	80

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC
NUTRIENT REGIME: MESOTROPHIC
SOIL DRAINAGE: WELL
ELEVATION: 625 -1212 M
SLOPE: 0 - 20 %
ASPECT: SOUTH - WESTERLY

FORAGE PRODUCTION IN KG/HA N=15

GRASS	247 (4-504)
FORBS	366 (88-867)
SHRUBS	235 (0-1230)
TOTAL	848 (174-1882)

SUGGESTED GRAZING
2.1 HA/AUM

e9: Aspen/ Snowberry

(Populus tremuloides/ Symphoricarpos occidentalis)

n=6 Snowberry is well adapted to well drained sites and has been found to be common on gravelly flood plains and south facing slopes overlooking rivers and streams throughout the Boreal Forest. This community type was found on the south facing banks of the McLeod River. The soils were fine textured fluvial deposits which may account for the high cover of low bush cranberry.

The forage production within this community type is very good and is palatable to livestock, however use is contingent on accessibility based on slope and shrub density - distribution. Consequently, this community type would be rated as secondary range.

PLANT COMPOSITION	CANOPY COVER(%) MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	63	45-90	100
BALSAM POPLAR *(Populus balsamifera)*	3	0-10	33
SHRUBS			
SNOWBERRY *(Symphoricarpos occidentalis/alba)*	26	12-43	100
RASPBERRY *(Rubus idaeus)*	6	2-10	100
ROSE *(Rosa acicularis)*	9	0-12	83
LOW BUSH CRANBERRY *(Viburnum edule)*	6	0-27	50
FORBS			
CREAM-COLOURED VETCHLING (PEAVINE) *(Lathyrus ochroleucus)*	4	1-13	100
AMERICAN VETCH *(Vicia americana)*	2	1-6	100
NORTHERN BEDSTRAW *(Galium boreale)*	1	1-3	100
TALL LUNGWORT *(Mertensia paniculata)*	4	0-9	83
WILD LILY OF THE VALLEY *(Maianthemum canadense)*	1	0-4	83
CANADA VIOLET *(Viola canadensis)*	5	0-25	67
STRAWBERRY *(Fragaria virginiana)*	3	0-8	67
BUNCHBERRY *(Cornus canadensis)*	1	0-3	67
GRASSES			
HAIRY WILD RYE *(Elymus innovatus)*	3	0-6	83
MARSH REED GRASS *(Calamagrostis canadensis)*	3	0-6	67
SLENDER WHEATGRASS *(Agropyron trachycaulum)*	3	0-11	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC TO SUBHYGRIC

NUTRIENT REGIME: MESOTROPHIC TO PERMESOTROPHIC

SOIL DRAINAGE: WELL

ELEVATION: 969 M (625 - 1204)

SLOPE: 1-10 %

ASPECT: SOUTH-WESTERLY

FORAGE PRODUCTION IN KG/HA: N=2

GRASS	408 (256-560)
FORBS	580 (360-800)
SHRUBS	408 (182-634)
TOTAL	1396 (798-1396)

SUGGESTED GRAZING
1.3 HA/AUM

e10: Aspen/ White Meadowsweet

(Populus tremuloides/ Spiraea betulifolia)

n=15 This community type is found on well-drained northerly aspects throughout the Saddle Hills. White meadowsweet is characteristic of drier site conditions in deciduous and coniferous forests and can also be found on dry, rocky slopes (MacKinnon et al 1992).

The forage production within this community type is very good and is palatable to livestock, however use is contingent on accessibility based on slope and shrub density - distribution. Consequently, this community type would be rated as primary or secondary range.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
ASPEN			
(Populus tremuloides)	61	14-85	100
SHRUBS			
WHITE MEADOWSWEET			
(Spiraea betulifolia)	17	12-34	100
ROSE			
(Rosa acicularis)	10	4-15	100
LOW BUSH CRANBERRY			
(Viburnum edule)	5	0-8	80
RASPBERRY			
(Rubus idaeus)	5	0-18	80
TWIN-FLOWER			
(Linnaea borealis)	4	0-15	67
BRACTED HONEYSUCKLE			
(*Lonicera involucrata*)	2	0-6	53
FORBS			
BUNCHBERRY			
(*Cornus canadensis*)	12	3-30	100
CREAM-COLOURED VETCHLING			
(Lathyrus ochroleucus)	5	1-11	100
WILD SARSAPARILLA			
(Aralia nudicaulis)	8	0-17	87
DEWBERRY OR RUNNING RASPBERRY			
(Rubus pubescens)	3	0-8	87
COMMON PINK WINTERGREEN			
(*Pyrola asarifolia*)	3	0-6	87
WILD LILY OF THE VALLEY			
(Maianthemum canadense)	2	0-9	87
FIREWEED			
(Epilobium angustifolium)	6	0-26	80
STRAWBERRY			
(Fragaria virginiana)	4	0-12	80
GRASSES			
MARSH REED GRASS			
(Calamagrostis canadensis)	4	0-14	80
HAIRY WILD RYE			
(Elymus innovatus)	4	0-13	53

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: MESOTROPHIC

SOIL DRAINAGE: WELL

ELEVATION: 928 M (724 - 1189)

SLOPE: 1-6 %

ASPECT: NORTH-EASTERLY

FORAGE PRODUCTION IN KG/HA: N=6

GRASS	274 (4-418)
FORBS	584 (356-1065)
SHRUBS	100 (4-170)
TOTAL	959 (548-1505)

SUGGESTED GRAZING
1.9 HA/AUM

e11: Aspen/ Beaked Hazelnut/ Wild Sarsaparilla

(Populus tremuloides/ Corylus cornuta/ Aralia nudicaulis)

n=9 This community type is rare throughout the Lower Foothills subregion and is very similar to the abundant Aw/Corylus-Rose/ Wild sarsaparilla (Downing and Karpuk 1992) and Aw/beaked hazelnut (Beckingham and Archibald 1996) community types both described in the Dry Mixedwood subregion. This type appears to occupy wetter and slightly better nutrient microsites (northerly) and have a microclimate resembling the Dry Mixedwood subregion. Corns and Annas (1986) felt that wild sarsaparilla grows under moist, nutrient rich conditions; wild sarsaparilla is also sensitive to disturbance and grazing may cause the tall forb layer to become sparse.

The total production of this type is high, but the majority of the production is coming from hazelnut which is largely unpalatable to livestock at proper stocking levels. The high cover of hazelnut also restricts access to livestock, limiting the forage availability. This community type should be rated as secondary range.

PLANT COMPOSITION	CANOPY COVER(%) MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	46	20-70	100
BALSAM POPLAR *(Populus tremuloides)*	5	0-20	67
SHRUBS			
BEAKED HAZELNUT *(Corylus cornuta)*	31	2-64	100
ROSE *(Rosa acicularis)*	11	0-19	89
LOW BUSH CRANBERRY *(Viburnum edule)*	4	0-7	89
RASPBERRY *(Rubus ideaus)*	4	0-16	78
SNOWBERRY *(Symphoricarpos occidentalis/alba)*	4	0-9	80
BRACTED HONEYSUCKLE (*Lonicera involucrata*)	3	0-11	67
FORBS			
WILD SARSAPARILLA *(Aralia nudicaulis)*	9	1-21	100
WILD LILY-OF-THE-VALLEY *(Maianthenmum canadense)*	2	1-6	100
LINDLEY'S ASTER (*Aster ciliolatus*)	2	1-4	100
STRAWBERRY *(Fragaria virginiana)*	2	1-3	100
BUNCHBERRY *(Cornus canadensis)*	7	0-22	89
DEWBERRY OR RUNNING RASPBERRY *(Rubus pubescens)*	3	0-8	89
CREAM-COLOURED VETCHLING *(Lathyrus ochroleucus)*	2	0-6	89
PALMATED COLTSFOOT (*Petasites palmatus*)	1	0-3	89
BISHOP'S-CAP (*Mitella nuda*)	3	0-7	78
CANADA VIOLET (*Viola canadensis*)	3	0-8	67
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	3	1-12	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC TO SUBHYGRIC
NUTRIENT REGIME: MESOTROPHIC TO PERMESOTROPHIC

SOIL DRAINAGE: MODERATELY WELL

ELEVATION: 897 M (686 - 1212 M)

SLOPE: 0 - 10 %

ASPECT: NORTH-WESTERLY

FORAGE PRODUCTION IN KG/HA: N=6

GRASS	346 (0-736)
FORBS	428 (120-878)
SHRUBS	465 (88-1064)
TOTAL	1240 (798-2216)

SUGGESTED GRAZING
1.5 HA/AUM

e12: Aspen/ Bracted Honeysuckle

(Populus tremuloides/ Lonicera involucrata)

n=6 Bracted honeysuckle is viewed as an indicator of a moderately moist (subhyric) rich nutrient ecosite and tends to be the most productive ecosite for the Lower Foothills Subregion and in the entire province(Beckingham et al 1996). This community type is generally found on northerly mid to low slope positions receiving nutrient rich seepage waters from upslope. White spruce is developing in the understory indicating a succession to a mixed Aw-Sw stand climaxing to a Sw dominated stand. Under harvesting conditions it is believed that this community will revert to a i10 Aw/honeysuckle/horsetail type with horsetail emerging with more moister readily available.

The total production of this type is high (only 3 production clippings and found to be an under estimate of the total forage availability), with diverse shrub and forb layers; however the high cover of shrubs can restricts access to livestock, limiting the forage availability. This community type should be rated as secondary range.

PLANT COMPOSITION	CANOPY COVER(%)		
	MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	63	30-75	100
PAPER BIRCH (*Betula papyrifera*)	4	0-10	50
BALSAM POPLAR *(Populus tremuloides)*	3	0-10	33
SHRUBS			
BRACTED HONEYSUCKLE (*Lonicera involucrata*)	23	10-50	100
LOW BUSH CRANBERRY *(Viburnum edule)*	11	5-25	100
ROSE *(Rosa acicularis)*	11	2-15	100
WHITE SPRUCE (*Picea glauca*)	10	0-28	85
PAPER BIRCH *(Betula papyrifera)*	4	0-12	85
RASPBERRY *(Rubus ideaus)*	3	0-13	67
CURRANT *(Ribes spp.)*	2	0-4	80
FORBS			
BUNCHBERRY *(Cornus canadensis)*	7	1-12	100
FIREWEED (*Epilobium angustifolium*)	4	1-13	100
DEWBERRY OR RUNNING RASPBERRY *(Rubus pubescens)*	3	1-9	100
TALL LUNGWORT *(Mertensia paniculata)*	2	1-5	100
WILD SARSAPARILLA *(Aralia nudicaulis)*	10	0-15	83
BISHOP'S-CAP (*Mitella nuda*)	2	0-6	83
TWIN-FLOWER (*Linnaea borealis*)	4	0-10	67
CREAM-COLOURED VETCHLING *(Lathyrus ochroleucus)*	3	0-7	67
LINDLEY'S ASTER (*Aster ciliolatus*)	2	0-5	50
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	7	2-10	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC

NUTRIENT REGIME: PERMESOTROPHIC

SOIL DRAINAGE: MODERATELY WELL

ELEVATION: 940 M (762 - 1230 M)

SLOPE: 0 - 5 %

ASPECT: NORTHERLY

FORAGE PRODUCTION IN KG/HA: N=3

GRASS	270 (72-489)
FORBS	419 (250-508)
SHRUBS	135 (56-260)
TOTAL	824 (694-984)

SUGGESTED GRAZING
2.2 HA/AUM

e13: Aspen/ Thimbleberry

(Populus tremuloides/ Rubus parviflorus)

n=6 This community type is generally rare within the Lower Foothills Subregion, it is more commonly found within the Montane Subregion as indicated by Willoughby et al (1998) and Archibald et al (1996) to be found on nutrient rich seepage areas. This community type was found along the north-easterly banks of the Smoky River, NE of Grande Prairie.

Forage production of this type can be quite high because of the favourable moisture and nutrient conditions. However, Thimbleberry is generally unpalatable to livestock, although Willoughby et al (1998) found it to have a productive grass and forb layer. Usable forage production is quite low due to the predominance of thimbleberry and thereby is considered to be non-use for domestic livestock.

PLANT COMPOSITION	CANOPY COVER(%) MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	30	24-40	100
PAPER BIRCH (*Betula papyrifera*)	4	0-7	67
BALSAM POPLAR *(Populus tremuloides)*	3	0-7	67
SHRUBS			
THIMBLEBERRY (*Rubus parviflorus*)	44	18-85	100
ROSE *(Rosa acicularis)*	7	4-9	100
RIVER ALDER (*Alnus tenuifolia*)	5	3-7	100
LOW-BUSH CRANBERRY *(Viburnum edule)*	4	1-7	100
SASKATOON *(Amelanchier alnifolia)*	4	0-7	67
FORBS			
BUNCHBERRY *(Cornus canadensis)*	6	4-6	100
WILD SARSAPARILLA *(Aralia nudicaulis)*	4	2-5	100
CREAM-COLOURED VETCHLING *(Lathyrus ochroleucus)*	2	1-2	100
DEWBERRY OR RUNNING RASPBERRY *(Rubus pubescens)*	1	1-2	100
WILD-LILY-OF-THE-VALLEY (*Maianthemum canadense*)	1	1-2	67
SHOWY ASTER *(Aster conspicuus)*	1	1-2	67
GRASSES			
WHITE-GRAINED MOUNTAIN RICE GRASS (*Oryzopsis asperifolia*)	6	1-13	100
MARSH REED GRASS *(Calamagrostis canadensis)*	5	1-6	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC

NUTRIENT REGIME: PERMESOTROPHIC

SOIL DRAINAGE: MODERATELY WELL

ELEVATION: 674 M

SLOPE: 0 - 5 %

ASPECT: NORTHERLY

FORAGE PRODUCTION IN KG/HA: N=3

GRASS	71 (0-214)
FORBS	195 (74-326)
SHRUBS	469 (204-988)
TOTAL	735 (288-1172)

SUGGESTED GRAZING
2.5 HA/AUM

e14: Aspen/ Oak Fern

(Populus tremuloides/ Gymnocarpium dryopteris)

n=2 This community type is similar to the aspen facies of the Sw/Devil's Club/Oak Fern association described by Corns and Annas (1986) and the Aw/ Low-bush Cranberry/ Fern community type described by Beckingham (1994). Both authors felt that this community type receives a supply of nutrient rich seepage water at some time during the growing season.

The high moisture content and nutrient supply allows for good understory production. Due to the smal sample size the forage production is considered to be an under estimate, however, the oak fern can dominant the forb layer creating a secondary to non-use forage base for domestic livestock.

PLANT COMPOSITION	CANOPY COVER(%) MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	53	40-65	100
PAPER OR WHITE BIRCH *(Betula papyrifera)*	8	0-15	50
SHRUBS			
RASPBERRY *(Rubus idaeus)*	12	1-22	100
LOW BUSH CRANBERRY *(Viburnum edule)*	9	8-10	100
ROSE *(Rosa acicularis)*	5	4-5	100
WHITE MEADOWSWEET *(Spiraea betulifolia)*	2	1-3	100
SNOWBERRY *(Symphoricarpos occidentalis)*	9	0-18	50
BRACTED HONEYSUCKLE *(Lonicera involucrata)*	5	0-9	50
WILLOW *(Salix spp.)*	2	0-3	50
FORBS			
OAK FERN *(Gymnocarpium dryopteris)*	20	17-22	100
BUNCHBERRY *(Cornus canadensis)*	13	6-18	100
WILD SARSAPARILLA *(Aralia nudicaulis)*	11	3-17	100
TALL LUNGWORT *(Mertensia paniculata)*	7	6-7	100
PALMATED COLTSFOOT *(Petasites palmatus)*	5	2-7	100
COMMON PINK WINTERGREEN *(Pyrola asarifolia)*	4	1-8	100
DEWBERRY OR RUNNING RASPBERRY *(Rubus pubescens)*	3	1-5	100
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	5	1-9	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC

NUTRIENT REGIME: PERMESOTROPHIC

SOIL DRAINAGE: MODERATELY WELL

ELEVATION: 875 M

SLOPE: 2%

ASPECT: NORTHERLY

FORAGE PRODUCTION IN KG/HA N=1

GRASS	20
FORBS	218
SHRUBS	148
TOTAL	366

SUGGESTED GRAZING
NON-USE

e15: Aspen/ Willow

(Populus tremuloides/ Salix spp.)

n=16 This community type is found on lower slope seepage areas with moderately moist, nutrient rich soils. It is often found in association with other moisture-adapted shrub species such as honeysuckle, dogwood, and to a lesser extent alder. This may be found upslope, in transition, from willow shrubland areas and is an important cover and browse for moose.

The forage production is suggests it is adequate for livestock grazing, however the accessibility is density-dependant on willow and other co-dominant shrub species that can act as a barrier to livestock access. This community type will is considered secondary range to non-use range depending on the density shrub species.

PLANT COMPOSITION	CANOPY COVER(%) MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	38	18-65	100
BALSAM POPLAR *(Populus balsamifera)*	5	0-16	63
SHRUBS			
WILLOW (*Salix spp.*)	17	2-35	100
ROSE *(Rosa acicularis)*	10	3-33	100
BRACTED HONEYSUCKLE *(Lonicera involucrata)*	4	0-11	81
LOW BUSH CRANBERRY *(Viburnum edule)*	4	0-8	69
BUFFALO-BERRY (*Sheperdia canadensis*)	3	0-15	69
RED-OSIER DOGWOOD (*Cornus stolonifera*)	2	0-6	33
FORBS			
STRAWBERRY *(Fragaria virginiana)*	4	0-5	100
LINDLEY'S ASTER *(Aster ciliolatus)*	4	0-5	100
FIREWEED *(Epilobium angustifolium)*	13	0-35	88
BUNCHBERRY (*Cornus canadensis*)	5	0-14	88
COMMON PINK WINTERGREEN *(Pyrola asarifolia)*	2	0-4	88
DEWBERRY OR RUNNING RASPBERRY *(Rubus pubescens)*	4	0-8	81
TALL LUNGWORT *(Mertensia paniculata)*	3	0-8	81
SHOWY ASTER (*Aster conspicuus*)	3	0-10	63
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	6	0-15	88

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC TO HYGRIC

NUTRIENT REGIME: MESIC TO PERMESOTROPHIC

SOIL DRAINAGE: MODERATELY WELL

ELEVATION: 800 M

SLOPE: 0-5 %

ASPECT: NORTHERLY

FORAGE PRODUCTION IN KG/HA N=6

GRASS	174 (38-396)
FORBS	390 (78-1164)
SHRUBS	167 (40-350)
TOTAL	731 (234-1308)

SUGGESTED GRAZING
2.5 HA/AUM

e16: Aspen/ Rose/ Horsetail

(Populus tremuloides/ Rosa acicularis/ Equisetum arvense)

n=3 This community type is moister and richer than the modal Aw/Rose/Low Forbs and Aw/Rose/Tall Forbs types. It is similar to Beckingham's (1994) Aw-Pb/Horsetail community type and will likely succeed to the Sw/Horsetail/Step Moss ecosystem association of Corns and Annas (1986).

This community type has a fair forage base for livestock and the cover of palatable plants is high. Also, because of the high moisture and nutrient regimes regrowth potential after grazing is good.

PLANT COMPOSITION	CANOPY COVER(%) MEAN	RANGE	CONST.
TREES			
ASPEN			
(Populus tremuloides)	42	7-65	100
SHRUBS			
ROSE			
(Rosa acicularis)	18	1-40	100
RASPBERRY			
(Rubus idaeus)	8	0-30	63
SASKATOON			
(Amelanchier alnifolia)	4	0-20	50
SNOWBERRY	3	0-11	50
(Symphoricarpos occidentalis)			
WILLOW			
(Salix spp.)	6	0-20	75
ASPEN			
(Populus tremuloides)	5	0-15	75
FORBS			
FIELD HORSETAIL			
(Equisetum arvense)	22	6-55	100
STRAWBERRY			
(Fragaria virginiana)	4	1-12	100
FIREWEED			
(Epilobium angustifolium)	7	0-30	88
PALMATED COLTSFOOT			
(Petasites palmatus)	6	0-25	88
TALL LUNGWORT			
(Mertensia paniculata)	5	0-23	88
LINDLEY'S ASTER			
(Aster ciliolatus)	4	0-7	88
AMERICAN VETCH			
(Vicia americana)	2	0-5	88
CREAM-COLOURED VETCHLING			
(Lathyrus ochroleucus)	3	0-8	75
GRASSES			
MARSH REED GRASS			
(Calamagrostis canadensis)	23	5-60	100
FRINGED BROME GRASS			
(Bromus ciliatus)	3	0-10	50
SLENDER WHEAT GRASS			
(Agropyron trachycaulum)	2	0-10	38

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC

NUTRIENT REGIME: PERMESOTROPHIC

SOIL DRAINAGE: MODERATELY WELL TO IMPERFECTLY

ELEVATION: 946 M (647 - 1570 M)

SLOPE: 1 - 20%

ASPECT: NORTHERLY

FORAGE PRODUCTION IN KG/HA N=6

GRASS	406 (127-640)
FORBS	536 (175-1024)
SHRUBS	319 (0-669)
TOTAL	1260 (751-1690)

SUGGESTED GRAZING
1.4 HA/AUM

ASPEN - BALSAM POPLAR - PAPER BIRCH COMMUNITY TYPES

OF THE

LOWER FOOTHILLS SUBREGION

Photo : An Aspen - Balsam Poplar - White Birch/ Rose/ Marsh Reed Grass community type. This community occurs on upland seepage areas and provides suitable forage for domestic grazing.

Ecology of Aspen - Balsam Poplar - Paper Birch Community Types of the Lower Foothills subregion

In the Lower Foothills subregion deciduous forest stands on moist-nutrient rich sites are often codominated by aspen, balsam poplar and to some extent paper birch. Balsam poplar grows best on moist, nutrient-rich, imperfectly-drained, on low-lying ground and paper birch is well adapted to growing on mesic-loamy soils, medium shade tolerance, and is fairly tolerant of nutrient deficits (La Roi 1991). Beckingham (1993) also found that paper birch may prefer to grow on soils with a lower pH (<5.3). Pure stands of Alaska variety paper birch are also found on dry sandy ridges with imperfect drainage (Wilkinson 1990). Beckingham (1993), found that white birch may prefer to grow on soils with a lower pH (<5.3).

The community sequence of aspen - balsam poplar - paper birch community types along a landscape profile is outlined in Figure 9. Moist upslope positions Aw-Pb/Marsh Reed Grass is found with late seral aspen stands. This community type is in close association with Aw-Pb/green alder/marsh reed grass which is found on mid to lower slopes with slightly higher moisture-nutrient regimes. The Aw-Pb/River alder community type is found on moist, imperfectly-drained floodplains, stream channels and topographic lower slope positions.

The Aw-Pb-Bw/Rose/Marsh reedgrass community type is also found on upper slopes that have moderately moist soils as apparent from the predominance of Pb and Bw. The Pb-Aw/Beaked hazelnut community type was also found in the Blueridge Upland ecodistrict on south facing, nutrient rich slopes.

Bracted honeysuckle, cow parsnip, devil's-club, green alder, oak fern, are associated with mid to lower slopes, moderately moist, nutrient rich sites created from seepage waters (Beckingham et al 1996).

The Pb/Snowberry and Aw-Pb/Dogwood community types are found on moist, nutrient rich, seepages, drainages or river flats. These community types are relatively rare throughout the subregion and would contribute little to the overall carrying capacity of a grazing disposition.

The Pb/Willow/Horsetail community type is considered to have a hygric-rich moisture-nutrient regime with high water tables and where organic matter tends to accumulate.

Table 8. Forage production summary for Aspen - Balsam Poplar - Paper Birch community types of the Lower Foothills subregion.

Ecosite	Community number	Community type	Productivity (kg/ha)				sample size (n)	Carrying capacity (ha/AUM)
			Grass	Forb	Shrub	Total		
f bracted honeysuckle subhygric/ rich	**Ecosite phase**	**f2 bracted honeysuckle Aw-Pb**	**365**	**532**	**316**	**1244**	**138**	**1.5**
	f1	Aw-Bw-Pb/bracted honeysuckle/oak fern	324	687	200	1211	2	1.5
	f2	Pb-Aw/beaked hazelnut	1103	263	739	2105	3	0.9
	f3	Aw-Pb/marsh reedgrass	875	674	429	1978	8	0.9
	f4	Aw-Pb-Bw/rose/marsh reedgrass	296	513	268	1078	30	1.7
	f5	Pb/snowberry	78	230	896	1204	1	1.5
	f6	Aw-Pb/alder/marsh reedgrass	475	543	297	1417	38	1.3
	f7	Aw-Pb/alder-honeysuckle	321	511	320	1152	24	1.6
	f8	Aw-Bw/alder-honeysuckle	131	383	385	899	2	2.0
	f9	Aw-Pb/river alder	245	545	397	1187	3	1.5
	f10	Aw-Pb/dogwood	216	607	485	1212	3	1.5
	f11	Aw-Pb/cowparsnip	350	792	277	1418	8	1.3
	f12	Pb-Aw/devil's club	140	548	238	926	1	2.0

Ecosite	Community number	Community type	Productivity (kg/ha)				sample size (n)	Carrying capacity (ha/AUM)
			Grass	Forb	Shrub	Total		
	Ecosite phase	**f2_harvest**	**1733**	**1117**	**175**	**4008**	**3**	**1.5**
	l11	marsh reedgrass/Pb/wild raspberry/fireweed	1853	1044	53	4424	2	1.5
	l12	Pb/green alder/marsh reedgrass	n/a	n/a	n/a	n/a	0	1.5
	l13	marsh reedgrass/Bw-Aw/willow	1492	1264	420	3176	1	1.5
i horsetail hygric/rich	**Ecosite phase**	**i1 horsetail Pb-Aw**	**406**	**536**	**319**	**1260**	**6**	**1.4**
	f13	Pb/willow/horsetail	n/a	n/a	n/a	n/a	0	1.4

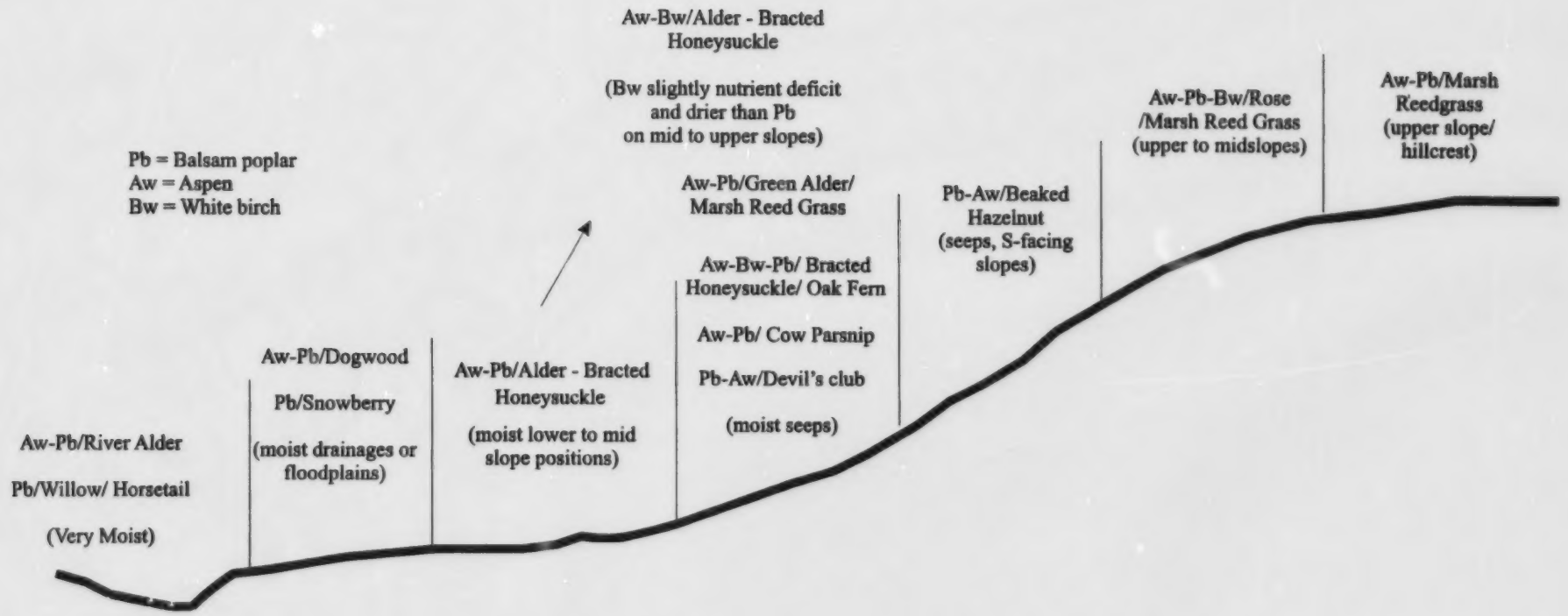

Aw-Bw/Alder - Bracted Honeysuckle
(Bw slightly nutrient deficit and drier than Pb on mid to upper slopes)
Pb = Balsam poplar
Aw = Aspen
Bw = White birch
Aw-Pb/Green Alder/ Marsh Reed Grass
Aw-Pb-Bw/Rose /Marsh Reed Grass (upper to midslopes)
Aw-Pb/Marsh Reedgrass (upper slope/ hillcrest)
Pb-Aw/Beaked Hazelnut (seeps, S-facing slopes)
Aw-Bw-Pb/ Bracted Honeysuckle/ Oak Fern
Aw-Pb/ Cow Parsnip
Pb-Aw/Devil's club
(moist seeps)
Aw-Pb/Dogwood
Pb/Snowberry
(moist drainages or floodplains)
Aw-Pb/Alder - Bracted Honeysuckle
(moist lower to mid slope positions)
Aw-Pb/River Alder
Pb/Willow/ Horsetail
(Very Moist)

Figure 9. Landscape profile of Aspen - Balsam Poplar - Paper Birch community types within the Lower Foothills Subregion.

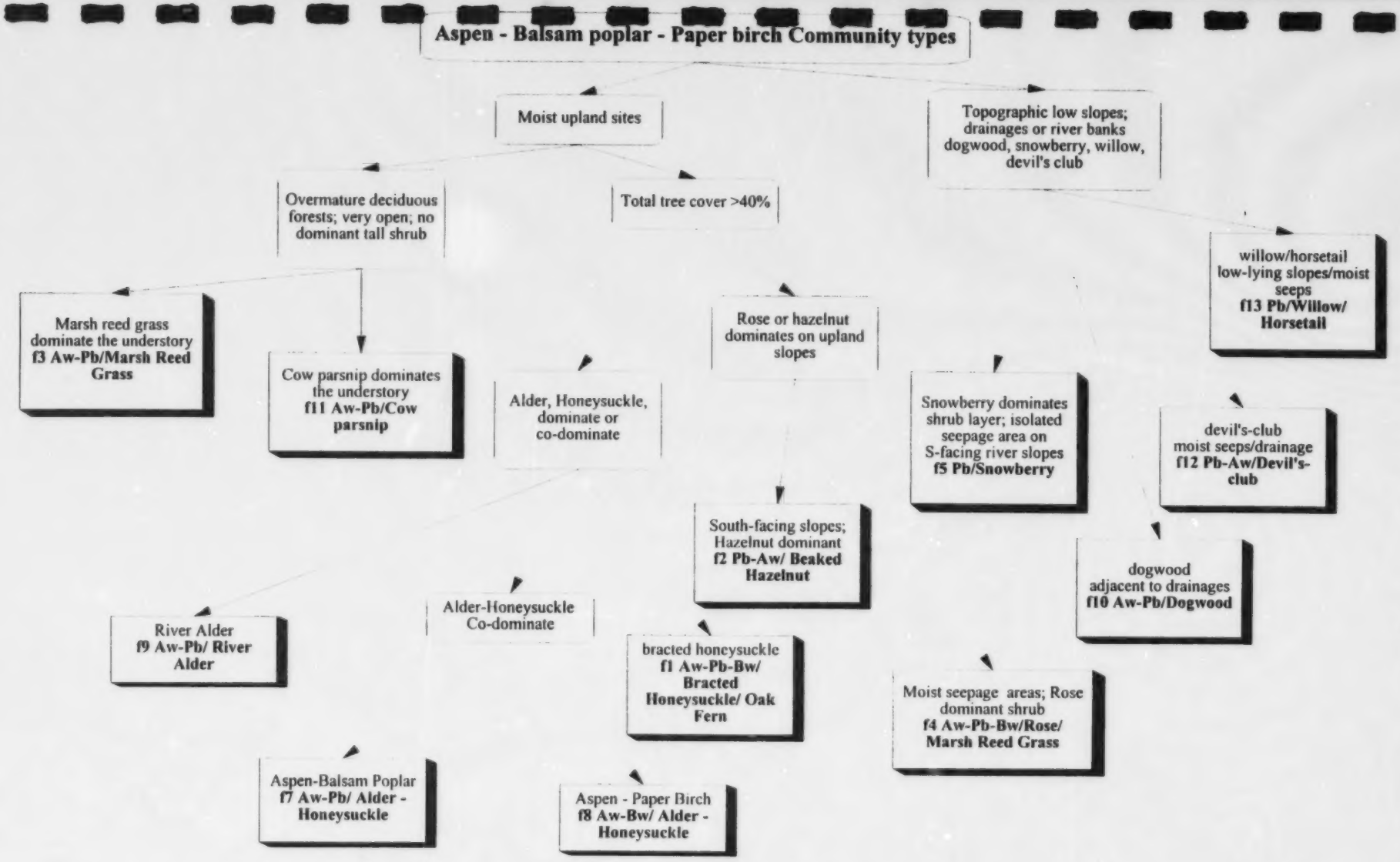

Aspen - Balsam poplar - Paper birch Community types
Moist upland sites
Topographic low slopes; drainages or river banks dogwood, snowberry, willow, devil's club
Overmature deciduous forests; very open; no dominant tall shrub
Total tree cover >40%
willow/horsetail low-lying slopes/moist seeps f13 Pb/Willow/ Horsetail
Marsh reed grass dominate the understory f3 Aw-Pb/Marsh Reed Grass
Cow parsnip dominates the understory f11 Aw-Pb/Cow parsnip
Rose or hazelnut dominates on upland slopes
Alder, Honeysuckle, dominate or co-dominate
Snowberry dominates shrub layer; isolated seepage area on S-facing river slopes f5 Pb/Snowberry
devil's-club moist seeps/drainage f12 Pb-Aw/Devil's-club
South-facing slopes; Hazelnut dominant f2 Pb-Aw/ Beaked Hazelnut
dogwood adjacent to drainages f10 Aw-Pb/Dogwood
River Alder f9 Aw-Pb/ River Alder
Alder-Honeysuckle Co-dominate
bracted honeysuckle f1 Aw-Pb-Bw/ Bracted Honeysuckle/ Oak Fern
Moist seepage areas; Rose dominant shrub f4 Aw-Pb-Bw/Rose/ Marsh Reed Grass
Aspen-Balsam Poplar f7 Aw-Pb/ Alder - Honeysuckle
Aspen - Paper Birch f8 Aw-Bw/ Alder - Honeysuckle

Figure 10. Key to the Aspen - Balsam Poplar - Paper Birch Community Types within the Lower Foothills Subregion

f1: Aspen-Paper Birch-Balsam Poplar/Bracted Honeysuckle/Oak Fern

(Populus tremuloides - Betula papyrifera - Populus balsamifera/ Lonicera involucrata/ Gymnocarpium dryopteris)

n=2 This community type is similar to Aw-Pb/bracted honeysuckle/fern type described by Beckingham et al (1996). It is typified by a closed deciduous tree canopy found on moist-rich upland seepage areas. These moist, shady understories are predominanted by ferns and often horsetails which do not provide palatable forage for domestic livestock, although there is suitable forage provided by fireweed, low forbs and marsh reed grass. If the fern layer dominants the understory this is considered non-use for livestock, with higher components of palatable forbs and grasses this would be suitable secondary range.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	28	25-30	100
PAPER BIRCH *(Betula papyrifera)*	20	0-40	50
BALSAM POPLAR *(Populus balsamifera)*	18	0-35	50
SHRUBS			
BRACTED HONEYSUCKLE *(Lonicera involucrata)*	13	10-16	100
LOW-BUSH CRANBERRY *(Viburnum edule)*	7	3-10	
100RASPBERRY *(Rubus idaeus)*	2	1-2	100
GREEN ALDER *(Alnus crispa)*	6	0-12	50
CURRANT *(Ribes spp.)*	5	4-5	50
FORBS			
OAK FERN *(Gymnocarpium dryopteris)*	25	8-43	100
FIREWEED *(Epilobium angustifolium)*	15	1-30	100
BISHOP'S CAP (*Mitella nuda*)	5	1-10	100
PALMATE-LEAVED COLTSFOOT *(Petasites palmatus)*	5	1-8	100
DEWBERRY OR RUNNING RASPBERRY *(Rubus pubescens)*	4	1-8	100
LADY FERN *(Athyrium filix-femina)*	3	3-4	100
WOOD HORSETAIL *(Equisetum sylvaticum)*	1	1-2	100
BUNCHBERRY (*Cornus canadensis*)	9	0-17	50
WILD SARSAPARILLA *(Aralia nudicaulis)*	8	0-15	50
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	11	6-15	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC

NUTRIENT REGIME: MESOTROPHIC TO PERMESOTROPHIC

SOIL DRAINAGE: MODERATELY WELL

ELEVATION: 1109 M

SLOPE: 3-15%

FORAGE PRODUCTION IN KG/HA: N=2

GRASS	324 (298-350)
FORBS	687 (450-924)
SHRUBS	200 (0-400)
TOTAL	1211 (1200-1222)

SUGGESTED GRAZING
1.5 HA/AUM

f2: Balsam Poplar - Aspen/ Beaked Hazelnut

(Populus balsamifera - Populus tremuloides/ Corylus cornuta)

n=4 This community type is similar to e11 Aw/beaked hazelnut described previously, however this type occurs on lower-sloped moist nutrient rich, seepage areas. Tree cover is dominated by balsam poplar and aspen and the shrub layer is dominated by hazelnut and rose. The high shrub cover limits the growth of grasses and forbs and restricts movement by cattle. This community type is very productive, but the majority of the production comes from hazelnut which is generally unpalatable to livestock. As a result, this community type would be rated as secondary range for domestic livestock.

PLANT COMPOSITION

	CANOPY COVER(%) MEAN	RANGE	CONST.
TREES			
BALSAM POPLAR *(Populus balsamifera)*	30	20-55	100
ASPEN *(Populus tremuloides)*	20	5-30	100
PAPER BIRCH *(Betula papyrifera)*	3	0-7	50
SHRUBS			
BEAKED HAZELNUT *(Corylus cornuta)*	30	10-67	100
ROSE *(Rosa acicularis)*	18	1-36	100
RASPBERRY *(Rubus idaeus)*	7	2-15	100
SNOWBERRY *(Symphoricarpos occidentalis)*	6	1-17	100
SASKATOON *(Amelanchier alnifolia)*	3	0-5	75
BRACTED HONEYSUCKLE *(Lonicera involucrata)*	2	0-4	75
FORBS			
CREAM-COLOURED VETCHLING *(Lathyrus ochroleucus)*	5	1-9	100
AMERICAN VETCH *(Vicia americana)*	2	1-6	100
DEWBERRY OR RUNNING RASPBERRY *(Rubus pubescens)*	2	1-4	100
TALL LUNGWORT *(Mertensia paniculata)*	2	1-7	100
WILD SARSAPARILLA *(Aralia nudicaulis)*	4	0-8	75
FIREWEED *(Epilobium angustifolium)*	4	0-8	75
BUNCHBERRY *(Cornus canadensis)*	6	0-13	50
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	13	1-39	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC TO SUBHYGRIC

NUTRIENT REGIME: MESOTROPHIC TO PERMESOTROPHIC

SOIL DRAINAGE: MODERATELY WELL TO WELL

ELEVATION: 856 M (891 - 1106 M)

SLOPE: 15 - 30 %

ASPECT: NORTHERLY

FORAGE PRODUCTION IN KG/HA: N=3

GRASS	1103 (10-2898)
FORBS	263 (4-660)
SHRUBS	739 (480-1002)
TOTAL	2105 (616-3904)

SUGGESTED GRAZING
0.9 HA/AUM

f3: Aspen-Balsam Poplar/Marsh Reed Grass

(Populus tremuloides - Populus balsamifera/ Calamagrostis canadensis)

n=13 This community type is typical of drier hilltops throughout the Blueridge Upland ecodistrict. It is typified by an open tree canopy dominated by aspen. Unlike the midslope (Aw-Pb/Alder/Marsh reedgrass) the alder cover is low ranging from 0-25%. The open tree and tall shrub layers allow for good growth of marsh reedgrass. On ungrazed sites marsh reedgrass dominates the understory vegetation. Increased grazing pressure causes a decline in grass cover and favours the growth of low growing forbs (strawberry, bunchberry, wintergreen). The predominance of strawberry on the sites sampled in this community type indicates the preference livestock have for these sites. This community type is primary range for domestic grazing.

PLANT COMPOSITION — CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	15	5-40	100
BALSAM POPLAR *(Populus balsamifera)*	4	0-30	76
SHRUBS			
ROSE *(Rosa acicularis)*	10	2-18	100
LOW-BUSH CRANBERRY *(Viburnum edule)*	5	0-9	92
RASPBERRY *(Rubus idaeus)*	4	0-7	85
BRACTED HONEYSUCKLE *(Lonicera involucrata)*	6	0-17	77
GREEN ALDER *(Alnus crispa)*	5	0-12	68
FORBS			
FIREWEED *(Epilobium angustifolium)*	5	1-12	100
DEWBERRY OR RUNNING RASPBERRY *(Rubus pubescens)*	6	1-11	100
BUNCHBERRY *(Cornus canadensis)*	5	0-19	92
CREAM-COLORED VETCHLING *(Lathyrus ochroleucus)*	2	0-7	92
COMMON PINK WINTERGREEN (*Pyrola asarifolia*)	2	0-9	92
STRAWBERRY *(Fragaria virginiana)*	9	0-32	85
PALMATE-LEAVED COLTSFOOT *(Petasites palmatus)*	4	0-7	85
LINDLEY'S ASTER (*Aster ciliolatus*)	4	0-9	85
TALL LUNGWORT (*Mertensia paniculata*)	2	0-4	85
WILD SARSAPARILLA *(Aralia nudicaulis)*	4	0-15	69
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	38	11-63	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC

NUTRIENT REGIME: MESOTROPHIC

SOIL DRAINAGE: MODERATELY WELL TO WELL

ELEVATION: 848 - 984 M

SLOPE: 5 - 7%

FORAGE PRODUCTION IN KG/HA: N=8

GRASS	875 (424-1486)
FORBS	674 (272-1412)
SHRUBS	429 (8-1440)
TOTAL	1978 (716-3122)

SUGGESTED GRAZING
0.9 HA/AUM

f4: Aspen-Balsam Poplar-Paper Birch/Rose/Marsh Reed Grass

(Populus tremuloides-Populus balsamifera -Betula papyrifera / Rosa acicularis/ Calamagrostis canadensis)

n=60 This community type is characterized by the dominance of Balsam poplar in the upper canopy with aspen as a sporadic codominant or subdominant. It is very similar to the Aw-Pb/Rose-Wild raspberry vegetation described by EMA (1993), only this type is found on wetter, more nutrient rich sites. There is a gradient from this type to the drier Aw-Pb/Rose-Wild raspberry EMA type and then further upslope on drier soils the Aw/Rose/Tall forb type (later in guide). The high moisture and nutrient supply allow for good production of low growing shrubs, tall forbs and grass. The relatively open canopy cover also allows for easy access to domestic livestock. The change in species composition of this c.t. as a result of overgrazing would be very similar to an overgrazed aspen stand, which is described later in the guide.

PLANT COMPOSITION

	CANOPY COVER(%) MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	24	0-65	90
BALSAM POPLAR *(Populus balsamifera)*	20	0-65	85
PAPER BIRCH *(Betula papyrifera)*	13	0-70	35
SHRUBS			
ROSE *(Rosa acicularis)*	14	0-45	97
LOW-BUSH CRANBERRY *(Viburnum edule)*	4	0-20	87
RASPBERRY *(Rubus idaeus)*	7	0-40	77
BRACTED HONEYSUCKLE *(Lonicera involucrata)*	5	0-41	67
SNOWBERRY *(Symphoricarpos occidentale)*	3	0-15	67
FORBS			
CREAM-COLOURED VETCHLING *(Lathyrus ochroleucus)*	4	0-10	93
STRAWBERRY *(Fragaria virginiana)*	6	0-12	92
NORTHERN BEDSTRAW *(Galium boreale)*	2	0-7	92
DEWBERRY OR RUNNING RASPBERRY *(Rubus pubescens)*	5	0-10	88
BUNCHBERRY *(Cornus canadensis)*	7	0-15	87
LINDLEY'S ASTER *(Aster ciliolatus)*	3	0-12	77
FIREWEED *(Epilobium angustifolium)*	3	0-12	75
WILD SARSAPARILLA *(Aralia nudicaulis)*	7	0-34	67
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	14	0-50	95
HAIRY WILD RYE *(Elymus innovatus)*	2	0-10	33

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC TO SUBHYGRIC

NUTRIENT REGIME: MESOTROPHIC TO PERMESOTROPHIC

SOIL DRAINAGE: MODERATELY WELL

ELEVATION: 894 M (671 - 1250 M)

SLOPE: 0 - 34%

ASPECT: NORTHERLY

FORAGE PRODUCTION IN KG/HA: N=30

GRASS	296 (32-1040)
FORBS	513 (100-1630)
SHRUBS	268 (4-784)
TOTAL	1078 (452-2679)

SUGGESTED GRAZING
1.7 HA/AUM

f5: Balsam Poplar/ Snowberry

(Populus balsamifera/ Symphoricarpos occidentale)

n=1 This vegetation type was found in a small seepage area on a slope overlooking the North Saskatchewan river. Snowberry prefers well drained habitats and has been found to be quite common on forested slopes and river flood plains throughout the Boreal forest. The presence of balsam poplar indicates that the moisture content is sufficient to allow for its growth.

This community type is usually found on small isolated sites. Consequently, it would contribute little to the overall carrying capacity of a lease.

PLANT COMPOSITION

	CANOPY COVER(%) RANGE		RANGE	CONST.
TREES				
BALSAM POPLAR *(Populus balsamifera)*	80	-	100	
SHRUBS				
SNOWBERRY *(Symphoricarpos occidentale)*	29	-	100	
RASPBERRY *(Rubus idaeus)*	6	-	100	
ROSE *(Rosa acicularis)*	3	-	100	
FORBS				
BANEBERRY *(Actaea rubra)*	8	-	100	
CANADA VIOLET *(Viola canadensis)*	8	-	100	
RICHARSON'S GERANIUM *(Geranium richarsonii)*	6	-	100	
CREAM-COLORED VETCHLING *(Lathyrus ochroleucus)*	6	-	100	
GRASSES				
MARSH REED GRASS *(Calamagrostis canadensis)*	7	-	100	
BLUNT SEDGE *(Carex obtustata)*	1	-	100	

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC

NUTRIENT REGIME: PERMESOTROPHIC

SOIL DRAINAGE: WELL TO MODERATELY WELL

ELEVATION: 1060 M

SLOPE: 3%

ASPECT: SOUTH

FORAGE PRODUCTION IN KG/HA: N=1

GRASS	78
FORBS	230
SHRUBS	896
TOTAL	1204

SUGGESTED GRAZING
1.5 HA/AUM

f6: Aspen - Balsam Poplar/ Alder/Marsh Reed Grass

(Populus tremuloides - Populus balsamifera/ Alnus crispa/ Calamagrostis canadensis)

n=55 This community type occupies mid to lower-slope positions and is easily recognized in the field by the presense of alder. Green alder *(Alnus crispa)* would be more abundant than river alder *(Alnus tenuifolia)* on midslope positions, and the opposite would be true on the lower slope positions. However, tree, forb and grass layers are very similar at both mid and lower-slope positions. The thickness of the alder is what determines this community type's suitability for domestic livestock. Where alder cover is extremely high (50-75%), this community type would be considered non-use due to limited access and lack of forage from the shading effect of alder. Where the alder cover is a little lower, marsh reedgrass will provide a good forage base and this community type could be considered primary range in these cases.

This community type is similar to the Pb-Aw/Alder type described by Beckingham (1993) and the Aw (Pb)/ Green alder/ Wild Sarsaparilla and Pb-Aw/ Bracted Honeysuckle- River alder community types described by Environmental Management Associates (EMA) (1993). This community type is found on mesic to hygric, moderately well-drained sites. The moisture regime is slightly wetter than the Pb-Aw/Rose community type, which likely accounts for the increased growth of alder.

PLANT COMPOSITION

	CANOPY COVER(%) MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	20	0-60	96
BALSAM POPLAR *(Populus balsamifera)*	17	0-60	95
SHRUBS			
GREEN ALDER *(Alnus crispa)*	36	5-85	100
ROSE *(Rosa acicularis)*	11	0-32	95
LOW-BUSH CRANBERRY *(Viburnum edule)*	4	0-10	86
RASPBERRY *(Rubus idaeus)*	8	0-33	86
BRACTED HONEYSUCKLE *(Lonicera involucrata)*	3	0-13	58
FORBS			
FIREWEED *(Epilobium angustifolium)*	5	0-10	93
DEWBERRY OR RUNNING RASPBERRY *(Rubus pubescens)*	4	0-12	91
BUNCHBERRY *(Cornus canadensis)*	5	0-13	89
PALMATE-LEAVED COLTSFOOT *(Petasites palmatus)*	4	0-12	89
TALL LUNGWORT *(Mertensia paniculata)*	3	0-12	89
WILD SARSAPARILLA *(Aralia nudicaulis)*	7	0-46	80
LINDLEY'S ASTER *(Aster ciliolatus)*	4	0-12	78
STRAWBERRY *(Fragaria virginiana)*	4	0-7	73
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	23	2-60	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC
NUTRIENT REGIME: PERMESOTROPHIC
SOIL DRAINAGE: MODERATELY WELL
ELEVATION: 903 M (582 - 1460 M)
SLOPE: 0 - 30 %
ASPECT: NORTHERLY

FORAGE PRODUCTION IN KG/HA: N=38

GRASS	475 (18-1444)
FORBS	543 (37-1372)
SHRUBS	297 (2-866)
TOTAL	1417 (229-2690)

SUGGESTED GRAZING
1.3 HA/AUM

f7: Aspen - Balsam Poplar/ Alder - Bracted Honeysuckle

(Populus tremuloides - Betula papyrifera/ Alnus crispa - Lonicera involucrata)

n=30 This community type is a transition between two community types described by Beckingham et al (1996), i.e. Aw-Pb/bracted honeysuckle/fern and Aw-Pb/green alder-river alder/fern. These community types are presistant on mid to low slopes and receive nutrient-rich seepage waters.

Forage production on this type is only moderate. A large component of the total production is coming from shrubs, of which the largest component is alder. Since alder is unpalatable to livestock there is little remaining forage left. This c.t. would be rated as secondary range for domestic livestock.

PLANT COMPOSITION

	CANOPY COVER(%) MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	21	5-38	100
BALSAM POPLAR *(Populus balsamifera)*	16	0-55	90
SHRUBS			
GREEN ALDER *(Alnus crispa)*	29	0-54	80
RIVER ALDER *(Alnus tenuifolia)*	10	0-40	37
BRACTED HONEYSUCKLE *(Lonicera involucrata)*	19	0-39	97
ROSE *(Rosa acicularis)*	11	0-25	97
LOW-BUSH CRANBERRY *(Viburnum edule)*	6	0-20	93
RASPBERRY *(Rubus idaeus)*	7	0-30	90
CURRANT *(Ribes spp.)*	3	0-30	85
FORBS			
FIREWEED *(Epilobium angustifolium)*	7	2-20	100
BUNCHBERRY *(Cornus canadensis)*	5	0-16	97
SWEET-SCENTED BEDSTRAW *(Galium triflorum)*	2	0-7	97
DEWBERRY *(Rubus pubescens)*	6	0-18	93
NORTHERN BEDSTRAW *(Galium boreale)*		3	
LINDLEY'S ASTER *(Aster ciliolatus)*	5	0-11	93
WILD SARSAPARILLA *(Aralia nudicaulis)*	4	0-15	73
COW PARSNIP *(Heracleum lanatum)*	3	0-16	47
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	21	0-63	97

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC

NUTRIENT REGIME: PERMESOTROPHIC

SOIL DRAINAGE: MODERATELY WELL

ELEVATION: 877 M (746 - 1049 M)

SLOPE: 0 - 20%

ASPECT: NORTH-EASTERLY

FORAGE PRODUCTION IN KG/HA: N=24

GRASS	321 (28-998)
FORBS	511 (30-2606)
SHRUBS	320 (2-928)
TOTAL	1152 (615-3120)

SUGGESTED GRAZING
1.6 HA/AUM

f8: Aspen - White Birch/ Alder - Bracted Honeysuckle

(Populus tremuloides - Betula papyrifera/ Alnus crispa - Lonicera involucrata)

n=3 This community type is dominated by aspen in the overstory and birch in the secondary canopy. It is very similar to the Aw-Bw/Rose/Bunchberry/Marsh reedgrass community type, but the high cover of alder distinquishes this community type from the other. This type has a similar moisture and nutrient regime to the Aw-Bw/Rose community type, but this type has poorer drainage which may account for the high cover of alder.

Forage production on this type is only moderate. Nearly half (47%) of the total production is coming from shrubs, of which the largest component is alder. Since alder is unpalatable to livestock there is little remaining forage left. This c.t. would be rated as secondary range for domestic livestock.

PLANT COMPOSITION

	CANOPY COVER(%) MEAN	RANGE	CONST.
TREES			
ASPEN			
(Populus tremuloides)	39	25-60	100
PAPER BIRCH			
(Betula papyrifera)	17	6-30	100
SHRUBS			
GREEN ALDER			
(Alnus crispa)	40	30-55	100
BRACTED HONEYSUCKLE			
(Lonicera involucrata)	22	5-40	100
PAPER BIRCH			
(Betula papyrifera)	8	2-8	100
CURRANT			
(Ribes spp.)	4	3-4	100
LOW-BUSH CRANBERRY			
(Viburnum edule)	3	0-5	67
RED-OSIER DOGWOOD			
(Cornus stolonifera)	3	0-6	67
FORBS			
DEWBERRY OR RUNNING RASPBERRY			
(Rubus pubescens)	20	4-50	100
BUNCHBERRY			
(Cornus canadensis)	11	10-12	100
STRAWBERRY			
(Fragaria virginiana)	8	5-10	100
WILD SARSAPARILLA			
(Aralia nudicaulis)	8	0-15	67
COMMON PINK WINTERGREEN			
(Pyrola asarifolia)	4	3-5	100
GRASSES			
MARSH REED GRASS			
(Calamagrostis canadensis)	25	5-40	100
FRINGED BROME			
(Bromus ciliatus)	3	2-5	100
MOSS			
FEATHERMOSS			
(Pleurozium schreberi)	3	3	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC

NUTRIENT REGIME: PERMESOTROPHIC

SOIL DRAINAGE: MODERATELY WELL

ELEVATION: 883 M (866 - 915 M)

SLOPE: 5-7 %

ASPECT: NORTHERLY

FORAGE PRODUCTION IN KG/HA: N=2

GRASS	131 (62-200)
FORBS	383 (299-467)
SHRUBS	385 (354-416)
TOTAL	899 (776-1021)

SUGGESTED GRAZING
2.0 HA/AUM

f9: Aspen - Balsam Poplar/ River Alder

(Populus tremuloides - Populus balsamifera/ Alnus tenuifolia)

n=6 This community type is found on lower slopes along natural drainages or areas with high water tables. River alder persists on moist sites and is replaced by green alder on slightly drier upper slope positions. This community type is similar to Aw-Pb/green alder-river alder/fern described by Beckingham et al (1996).

Forage production on this type is high however a large component is from unpalatable alder shrubs that act as a barrier to livestock access. This community type would be rated as secondary rangeto non-use for domestic livestock.

PLANT COMPOSITION

	CANOPY COVER(%) MEAN	RANGE	CONST.
TREES			
BALSAM POPLAR *(Populus balsamifera)*	12	1-30	100
ASPEN *(Populus tremuloides)*	10	4-20	100
PAPER BIRCH *(Betula papyrifera)*	2	0-5	67
SHRUBS			
RIVER ALDER *(Alnus tenuifolia)*	38	15-80	100
ROSE *(Rosa acicularis)*	12	1-25	100
BRACTED HONEYSUCKLE *(Lonicera involucrata)*	5	1-11	100
RASPBERRY *(Rubus idaeus)*	9	0-20	83
LOW-BUSH CRANBERRY *(Viburnum edule)*	6	0-12	83
RED-OSIER DOGWOOD *(Cornus stolonifera)*	4	0-13	67
CURRANT *(Ribes spp.)*	3	0-8	67
FORBS			
LINDLEY'S ASTER *(Aster ciliolatus)*	4	1-10	100
DEWBERRY OR RUNNING RASPBERRY *(Rubus pubescens)*	3	1-6	100
PALMATED COLTSFOOT *(Petasites palmatus)*	2	1-3	100
WILD SARSAPARILLA *(Aralia nudicaulis)*	5	0-15	83
COMMON HORSETAIL *(Equisetum arvense)*	3	0-5	83
TALL LUNGWORT *(Mertensia paniculata)*	2	0-6	83
SWEET-SCENTED BEDSTRAW *(Galium triflorum)*	2	0-4	83
CANADA VIOLET *(Viola canadensis)*	2	0-6	67
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	5	2-7	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC

NUTRIENT REGIME: PERMESOTROPHIC

SOIL DRAINAGE: IMPERFECTLY

ELEVATION: 763 M (364 - 1135 M)

SLOPE: 0 - 25%

FORAGE PRODUCTION IN KG/HA: N=3

GRASS	245 (91-372)
FORBS	544 (238-1078)
SHRUBS	397 (0-712)
TOTAL	1187 (888-1350)

SUGGESTED GRAZING
1.5 HA/AUM

f10: Aspen - Balsam Poplar/ Red-Osier Dogwood

(Populus tremuloides - Populus balsamifera/ Cornus stolonifera)

n=13 This community type is very similar to the Aw-Pb/dogwood/fern c.t. described by Beckingham et al (1996). It is found along stream banks and natural drainages that receive nutrient rich seepage waters. The diversity of tall and low shrubs accounts for the high nutrient status, however it also reduces the accessibility of these sites for domestic grazing. It provides excellent wildlife habitat and food values.

This community type would be rated as secondary range or non-use for domestic livestock.

PLANT COMPOSITION

	CANOPY COVER(%) MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	24	20-55	100
BALSAM POPLAR *(Populus balsamifera)*	9	0-20	77
SHRUBS			
ROSE *(Rosa acicularis)*	12	3-28	100
RED-OSIER DOGWOOD *(Cornus stolonifera)*	10	5-29	100
RASPBERRY *(Rubus idaeus)*	6	0-10	85
WILLOW *(Salix spp.)*	6	0-9	85
LOW-BUSH CRANBERRY *(Viburnum edule)*	5	0-16	85
BRACTED HONEYSUCKLE *(Lonicera involucrata)*	4	0-13	62
FORBS			
BUNCHBERRY *(Cornus canadensis)*	6	0-20	92
CREAM-COLOURED VETCHLING *(Lathyrus ochroleucus)*	3	0-7	92
FIREWEED *(Epilobium angustifolium)*	5	0-12	85
DEWBERRY OR RUNNING RASPBERRY *(Rubus pubescens)*	4	0-7	77
TALL LUNGWORT *(Mertensia paniculata)*	3	0-9	77
SHOWY ASTER *(Aster conspicuus)*	3	0-7	62
WILD SARSAPARILLA *(Aralia nudicaulis)*	8	0-35	54
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	9	1-30	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC

NUTRIENT REGIME: PERMESOTROPHIC

SOIL DRAINAGE: MODERATELY WELL TO IMPERFECTLY

ELEVATION: 728 M (364 - 1135 M)

SLOPE: 0 - 25%

ASPECT: NORTHERLY

FORAGE PRODUCTION IN KG/HA: N=3

GRASS	216 (68-400)
FORBS	607 (238-1088)
SHRUBS	485 (0-1266)
TOTAL	1212 (259-2422)

SUGGESTED GRAZING
1.5 HA/AUM

f11: Aspen - Balsam Poplar/ Cow parsnip

(Populus tremuloides - Populus balsamifera/ Heracleum lanatum)

n=8 Nutrient rich seepage occurs at some point in the growing season favouring the growth of cow parsnip. This community type was found lower sloped positions within Whitecourt Mountain and Solomon Creek Valley.

Forage productivity on these sites is generally quite high because of the favourable moisture and nutrient conditions. Cow parsnip is palatable to livestock and maybe extensively utilized. These sites have low shrub layer which makes the understory accessible for livestock. This community type could be rated as primary range.

PLANT COMPOSITION

	CANOPY COVER (%) MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	46	30-60	100
BALSAM POPLAR (*Populus balsamifera*)	6	0-25	75
PAPER BIRCH *(Betula papyrifera)*	5	0-15	50
SHRUBS			
ROSE *(Rosa acicularis)*	5	1-11	100
RASPBERRY *(Rubus idaeus)*	4	0-21	88
BRACTED HONEYSUCKLE (*Lonicera involucrata)*	2	0-6	75
SNOWBERRY *(Symphoricarpos occidentalis)*	2	0-4	62
FORBS			
COW PARSNIP *(Heracleum lanatum)*	11	2-19	100
CANADA VIOLET *(Viola canadensis)*	6	1-20	100
CREAM-COLOURED VETCHLING *(Lathyrus ochroelucus)*	2	0-4	100
LINDLEY'S ASTER (*Aster ciliolatus)*	6	0-15	88
TALL LUNGWORT (*Mertensia paniculata*)	3	0-13	88
DEWBERRY *(Rubus pubescens)*	3	0-6	88
VEINY MEADOW RUE *(Thalictrum venulosum)*	3	0-9	88
COMMON HORSETAIL *(Equistem arvense)*	3	0-6	63
GRASSES			
MARSH REEDGRASS *(Calamagrostis canadensis)*	7	0-21	88

ENVIRONMENTAL VARIABLES

MOISTURE REGIME (MEAN): SUBHYGRIC

NUTRIENT REGIME (MEAN): PERMESOTROPHIC

SOIL DRAINAGE: MODERATELY WELL TO IMPERFECT

ELEVATION: 915 M (786-988 M)

ASPECT: EASTERLY

SLOPE: 7 (6-9)%

FORAGE PRODUCTION IN KG/HA: N=8

GRASS	350 (28-858)
FORB	792 (356-1122)
SHRUB	277 (50-1014)
TOTAL	1418 (940-1978)

SUGGESTED GRAZING
1.3 HA/AUM

f12: Balsam Poplar - Aspen/ Devil's - Club

(Populus balsamifera - Populus tremuloides/ Oplopanax horridum)

n=1 This community type was found along natural drainges and nutrient rich-slopes along lower slope positions adjacent to Whitecourt Mountain. The terrain and vegetation associated with this community type indicates poor accessibility for domestic grazing. Majority of the shrub and forb layer is unpalatable (devil's club, hazelnut, oak fern, wild sarsaparilla) and is thereby considered non-use range.

PLANT COMPOSITION — CANOPY COVER (%)

	MEAN	RANGE	CONST.
TREES			
BALSAM POPLAR (*Populus balsamifera*)	40	-	100
ASPEN (*Populus tremuloides*)	20	-	100
PAPER BIRCH (*Betula papyrifera*)	10	-	100
SHRUBS			
DEVIL'S CLUB (*Oplopanax horridum*)	14	-	100
BRACTED HONEYSUCKLE (*Lonicera involucrata*)	5	-	100
LOW-BUSH CRANBERRY (*Viburum edule*)	2	-	100
BEAKED HAZELNUT (*Corylus cornuta*)	2	-	100
FORBS			
OAK FERN (*Gymnocarpium dryopteris*)	7	-	100
Wild Sarsaparilla (*Aralia nudicaulis*)	7	-	100
COW PARSNIP (*Heracleum lanatum*)	7	-	100
FAIRYBELLS (*Disporum trachycarpum*)	6	-	100
COMMON HORSETAIL (*Equisetum arvense*)	5	-	100
GRASSES			
MARSH REED GRASS (*Calamagrostis canadensis*)	3	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME (MEAN): SUBHYGRIC

NUTRIENT REGIME (MEAN): PERMESOTROPHIC

SOIL DRAINAGE: MODERATELY WELL

ELEVATION: 850 M

SLOPE: 25%

ASPECT: NORTH-EASTERLY

FORAGE PRODUCTION IN KG/HA: N=1

GRASS	140
FORB	548
SHRUB	238
TOTAL	926

SUGGESTED GRAZING

2.0 HA/AUM or non-use

f13: Balsam Poplar/ Willow/ Horsetail

(Populus balsamifera/ Salix spp./ Equisetum arvense)

n=3 This community type is similar Pb-Aw/horsetail c.t. described by Beckingham et al (1996) found on moist-rich Gleysolic soils. These sites are characterized by high water tables and will likely succeed to white spruce.

The shrub species richness and diversity restricts livestock access, however horses have been noticed to selectively graze different species of horsetail during the summer and winter months. This community type would be non-use for domestic cattle, however it may be used as secondary range for horses.

PLANT COMPOSITION	CANOPY COVER (%) MEAN	RANGE	CONST.
TREES			
BALSAM POPLAR (*Populus balsamifera*)	45	43-50	100
ASPEN (*Populus tremuloides*)	6	0-10	67
SHRUBS			
WILLOW (*Salix spp.*)	20	2-26	100
RED-OSIER DOGWOOD (*Cornus stolonifera*)	8	1-12	100
LOW-BUSH CRANBERRY (*Viburum edule*)	6	0-18	67
BRACTED HONEYSUCKLE (*Lonicera involucrata*)	6	0-14	67
SNOWBERRY (*Symphoricarpos albus*)	5	0-13	67
FORBS			
MEADOW HORSETAIL (*Equisetum pratense*)	14	6-20	100
WOODLAND HORSETAIL (*Equisetum sylvaticum*)	4	0-8	67
COMMON HORSETAIL (*Equisetum arvense*)	4	0-6	67
TALL LUNGWORT (*Mertensia paniculata*)	4	1-6	100
DEWBERRY (*Rubus pubescens*)	3	1-5	100
FIREWEED (*Epilobium angustifolium*)	2	1-2	100
BISHOP'S CAP (*Mitella nuda*)	2	1-2	100
GRASSES			
MARSH REEDGRASS (*Calamagrostis canadensis*)	5	2-7	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME (MEAN): SUBHYGRIC

NUTRIENT REGIME (MEAN): PERMESOTROPHIC

SOIL DRAINAGE: IMPERFECT TO POORLY

ELEVATION: 726 M

SLOPE: 1-3%

ASPECT: NORTH-EASTERLY

FORAGE PRODUCTION IN KG/HA: N=0

TOTAL 1260* (ESTIMATED)

SUGGESTED GRAZING
1.4 HA/AUM

GRAZED MODIFIED ASPEN COMMUNITY TYPES

OF THE

LOWER FOOTHILLS SUBREGION

Photo 12: This Aspen/ Rose/ Clover stand represents a heavily-grazed aspen forest. All of the tall forbs and most of the shrubs have disappeared. The forb layer is now dominated by grazing-resistant species such as, clover, strawberry, common pink wintergreen, and bunchberry.

Ecology of the Aspen grazed modified community types of the Lower Foothills Subregion

The Aspen/Rose-Low-bush Cranberry/Tall Forb plant community type are primary forage areas on modal, mesic/medium sites within the Lower Foothills. With moderate to heavy grazing regimes the canopy cover in the shrub and forb layer declines and there is an increase in low forbs; strawberry (*Fragaria virginiana*), bunchberry (*Cornus canadensis*), common pink wintergreen (*Pyrola asarifolia*), and clover (*Trifolium spp.*) (Willoughby 1995). This disturbance regimes has created two unique community types based on grazing succession. With prolonged moderate grazing regimes Aw/Rose/Strawberry is identified and under heavier grazing regimes Aw/Rose/Clover is the predominate community type, and on slightly drier sites Aw/Rose/Hairy Wild Rye/Clover predominates. With moderate to heavy grazing native shrub and forb richness, diversity, and forage production declines (898, 720, 480 kg/ha respectively), and as a result suggested grazing levels are reduced compared to the modal undisturbed community type (Aw/Rose-Low-bush Cranberry/Tall Forb at 957 kg/ha), However, It is presently unclear whether this community type can revert back to its modal undisturbed condition by restricting grazing. Monitoring an Aw/Rose/Clover, restricted from grazing, over the past 10 years has not changed its species composition.

When grazing pressure becomes severe, native plant species decline in cover and are replaced by kentucky bluegrass (*Poa pratensis*), dandelion (*Taraxacum officinale*) and clover (*Trifolium spp.*) to form the Aw/Kentucky Bluegrass/Clover community type. However, it is believed that kentucky bluegrass also an indicator of a slightly higher moisture/nutrient regime and as a result has a higher forage production (1178 kg/ha). To compensate for the loss of native species diversity it is recommended that grazing levels reflect a more conservative estimate; thereby the ecosite phase e2_low-bush cranberry Aw forage production summary is used (Table 10). However, it is presently unclear whether a more conservative estimate can restore native plant species, it is thereby used only as a management tool when determining carrying capacities.

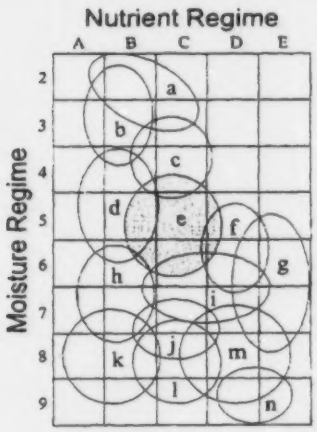
Table 9. Forage production summary for aspen grazed modified community types of the Lower Foothills subregion

	Community number	Community type	Productivity (kg/ha)				sample size (n)	Carrying capacity (ha/AUM)
			Grass	Forb	Shrub	Total		
c hairy wild rye submesic/ medium	**Ecosite phase**	**c2 hairy wild rye Aw**	**339**	**431**	**190**	**960**	**7**	**1.9**
	e1	Aw/blueberry	339	459	198	996	6	1.8
	e2	Aw/bearberry/fringed brome	339	263	145	747	1	2.4
	Ecosite phase	**c2_grazed Aw**	**58**	**282**	**34**	**374**	**2**	**4.8**
	g1	Aw/rose/hairy wild rye/clover	58	282	34	374	2	4.8
e low-bush cranberry mesic/ medium	**Ecosite phase**	**e2 low-bush cranberry Aw**	**275**	**435**	**206**	**917**	**116**	**2.0**
	e3	Aw/buffalo-berry	222	479	182	883	18	2.1
	e4	Aw/saskatoon	178	203	239	620	3	2.9
	e5	Aw/alder	260	404	198	861	27	2.1
	e6	Aw/alder/marsh reedgrass-hairy wild rye	264	512	113	889	3	2.0
	e7	Aw/rose-low-bush cranberry/tall forbs	321	460	177	957	34	1.9
	e8	Aw/rose-twinflower	247	366	235	848	15	2.1
	e9	Aw/snowberry	408	580	408	1396	2	1.3

Community number	Community type	Productivity (kg/ha)				sample size (n)	Carrying capacity (ha/AUM)
		Grass	Forb	Shrub	Total		
e10	Aw/white meadowsweet	294	627	101	1022	6	1.8
e11	Aw/beaked hazelnut/wild sarsaparilla	346	428	465	1240	6	1.5
Ecosite phase	**e2_grazed Aw**	**412**	**370**	**162**	**944**	**75**	**2.0**
g2	Aw/rose/strawberry	356	360	182	898	44	2.0
g3	Aw/rose/clover	154	414	152	720	13	2.5
g4	Aw/kentucky bluegrass/clover	681	380	117	1178	18	2.0
Ecosite phase	**e2_harvest Aw**	**766**	**803**	**516**	**2084**	**16**	**2.0**
l5	Aw/marsh reedgrass/rose/firweed	767	844	543	2154	15	2.0
l6	raspberry/marsh reedgrass/Aw	n/a	n/a	n/a	n/a	0	2.0
l7	beaked hazelnut/Aw/wild sarsaparilla	742	190	104	1036	1	2.0
Ecosite phase	**e2_harvest_grazed Aw**	**834**	**382**	**202**	**1418**	**9**	**2.0**
m2	Aw/buffalo-berry/clover	n/a	n/a	n/a	n/a	0	2.0
m3	strawberry-clover/rose/marsh reedgrass	405	331	541	1277	3	2.0

	Community number	Community type	Productivity (kg/ha)				sample size (n)	Carrying capacity (ha/AUM)
			Grass	Forb	Shrub	Total		
	m4	kentucky bluegrass/clover-dandelion	1048	408	33	1489	6	2.0
f bracted honeysuckle subhygric/ rich	**Ecosite phase**	**f2 bracted honeysuckle Aw-Pb**	**365**	**532**	**316**	**1244**	**138**	**1.5**
	e12	Aw/bracted honeysuckle	191	379	175	1097	4	1.7
	e13	Aw/thimbleberry	71	195	469	735	3	2.5
	e14	Aw/oak fern	0	218	148	366	1	5.0
	e15	Aw/willow	174	390	167	731	7	2.5
	Ecosite phase	**f2_harvest**	**1733**	**1117**	**175**	**4008**	**3**	**1.5**
	l10	Aw/bracted honeysuckle/horsetail	n/a	n/a	n/a	n/a	0	1.5
i horsetail hygric/rich	**Ecosite phase**	**i1 horsetail Pb-Aw**	**406**	**536**	**319**	**1260**	**6**	**1.4**
	e16	Aw/rose/horsetail	406	536	319	1260	6	1.4

e2 low-bush cranberry_grazed Aw n=115



CHARACTERISTIC SPECIES

Tree [60] aspen
[4] balsam poplar*
[1] white birch*
[1] white spruce*

Shrub [15] prickly rose
[4] wild red raspberry*
[2] low-bush cranberry*
[1] bracted honeysuckle*
[1] green alder*
[1] saskatoon*
[1] Canada buffalo-berry*
[1] snowberry*

Forb [10] clover spp.
[6] wild strawberry
[6] bunchberry
[4] dandelion
[4] cream-colored vetchling
[4] Lindley's aster
[2] northern bedstraw
[3] common pink wintergreen
[3] dewberry
[2] palmate-leaved coltsfoot
[2] wild lily-of-the valley
[1] northern bedstraw

Grass [6] marsh reedgrass
[6] kentucky bluegrass
[4] hairy wildrye

SITE CHARACTERTISTICS

Moisture Regime: subhyric[4], mesic[2]
Nutrient Regime: rich[4], medium[2]
Topographic Position: lower slope[3], mid slope[1], upper slope[2]
Slope: (2-5)[4], (10-15)[2]
Aspect: northerly[3], westerly[3]

SOIL CHARACTERISTICS**

Organic Thickness: (6-15)[6], (0-5)[4]
Humus Form: mor[6], raw moder[3]
Surface Texture: SiL[2], SL[2], L[1], Si[1]
Effective Texture: C[3],CL[2], SCL[1], SiC[1], SiCL[1]
Depth to Mottles/Gley: none[7], (0-25)[2]
Drainage: well[5], mod.well[4], imperfect[1]
Parent Material: M[5], GF[1]
Soil Subgroup: O.GL[3], BR.GL[3], GL.GL[1], E.EB[1]
Soil type: SM4[8], SD4[1]

PLANT COMMUNITY TYPES (N)

g2 Aw/rose/strawberry (65)
g3 Aw/rose/clover (21)
g4 Aw/kentucky bluegrass/clover (29)

FORAGE PRODUCTION (KG/HA) n=75

Grass 412 (12-1817)
Forb 370 (0-1228)
Shrub 162 (0-920)
Total 944 (210-2776)

SUGGESTED GRAZING HA/AUM

2.0

* Species characteristic of the phase but occurring in <70% of the sample plots with a prominence value <20. ** Soil Characteristics are from f2 bracted honeysuckle Aw-Pb Ecosite Phase summary.

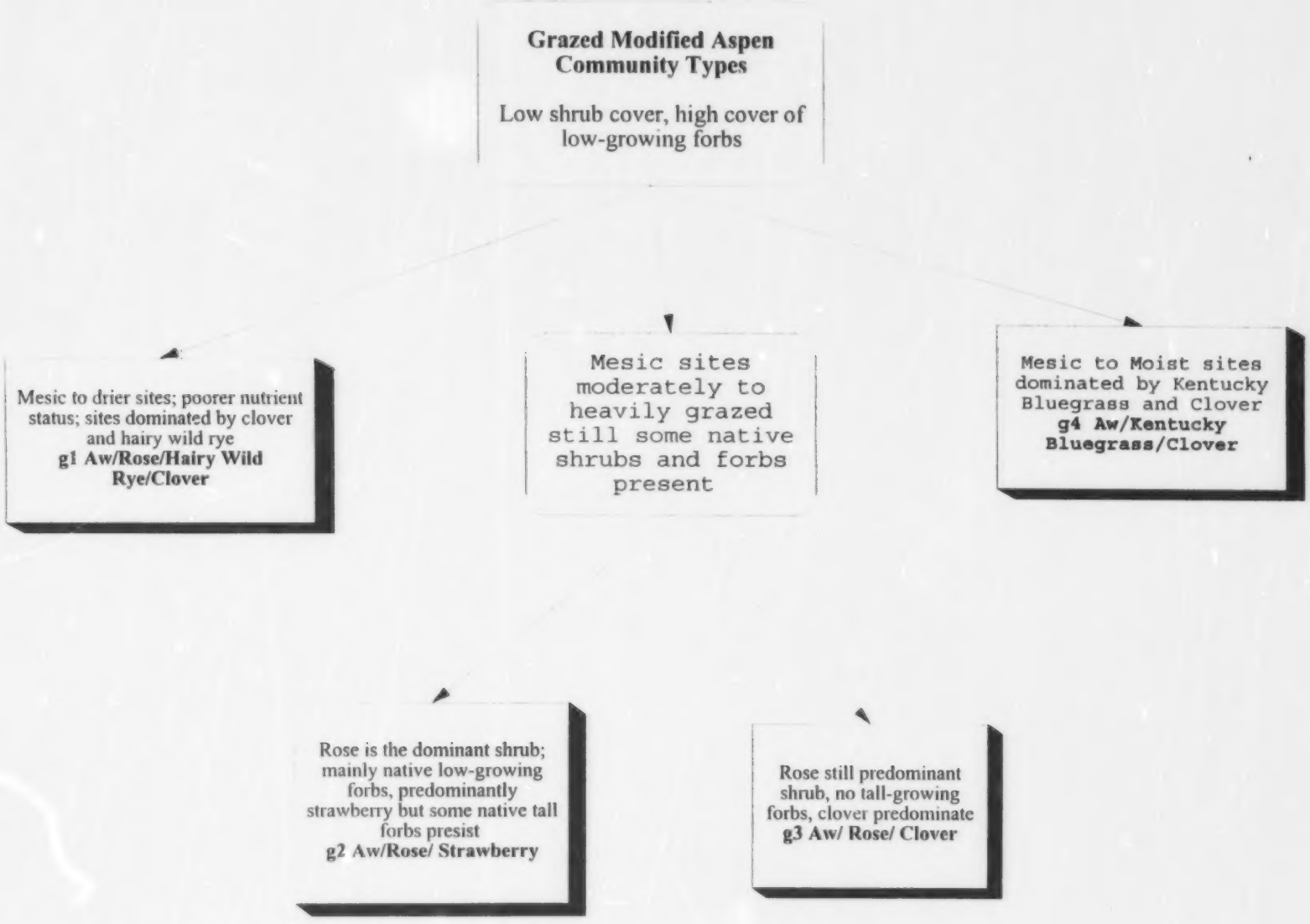

Grazed Modified Aspen Community Types
Low shrub cover, high cover of low-growing forbs
Mesic to drier sites; poorer nutrient status; sites dominated by clover and hairy wild rye
g1 Aw/Rose/Hairy Wild Rye/Clover
Mesic sites moderately to heavily grazed still some native shrubs and forbs present
Mesic to Moist sites dominated by Kentucky Bluegrass and Clover
g4 Aw/Kentucky Bluegrass/Clover
Rose is the dominant shrub; mainly native low-growing forbs, predominantly strawberry but some native tall forbs presist
g2 Aw/Rose/ Strawberry
Rose still predominant shrub, no tall-growing forbs, clover predominate
g3 Aw/ Rose/ Clover

Figure 11: Key to Aspen grazed modified community types of the Lower Foothills Subregion

g1: Aspen/ Rose/ Hairy Wild Rye/ Clover

(Populus tremuloides/ Rosa acicularis/ Elymus innovatus/ Trifolium repens or hybridum)

n=2 This community type represents an over-utilized aspen/rose community type as indicated by the predominance of clover. However, this c.t. seems to be at the drier end of a mesic/medium, with the predominance of hairy wild rye and the low forage production. This type is located on high elevation sites west of Sundre on the fringe between the Lower and Upper Foothills Subregions. Willoughby and Smith (1997) described a Aw/rose/hairy wild rye c.t. on dry south facing slopes throughout the Upper Foothills, this is a grazed modified variant of this Upper Foothills community type.

Under drier site conditions heavy grazing seems to lower forage production with the replacement of native forbs and grass with clover. This community type has a low forage production and requires a period of rest from grazing in order to replace native forbs and increase forage production. This community type has recommended as non-use.

PLANT COMPOSITION	CANOPY COVER(%) MEAN	RANGE	CONST.
TREES			
ASPEN			
(Populus tremuloides)	60	55-65	100
WHITE SPRUCE			
(Picea glauca)	8	0-15	50
SHRUBS			
ROSE			
(Rosa acicularis)	9	3-14	100
TWIN-FLOWER			
(Linnaea borealis)	6	3-8	100
BUFFALO-BERRY			
(Shepherdia canadensis)	4	0-8	50
FORBS			
CLOVER			
(Trifolium repens)	13	9-16	100
STRAWBEBRRY			
(Fragaria virginiana)	6	4-7	100
BUNCHBERRY			
(Cornus canadensis)	5	1-9	100
COMMON PINK WINTERGREEN			
(Pyrola asarifolia)	1	1	100
GRASSES			
HAIRY WILD RYE			
(Elymus innovatus)	24	22-25	100
PURPLE OAT GRASS			
(Schizachne purpurascens)	7	0-14	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: MESOTROPHIC

SOIL DRAINAGE: WELL

ELEVATION: 1290 M

SLOPE: 2-5 %

ASPECT: EASTERLY

FORAGE PRODUCTION IN KG/HA N=2

GRASS	58 (30-86)
FORBS	282 (240-324)
SHRUBS	34 (10-58)
TOTAL	374 (328-420)

SUGGESTED GRAZING

4.8 HA/AUM or non-use

g2: Aspen/ Rose/ Strawberry

(Populus tremuloides/ Rosa acicularis/ Fragaria virginiana)

n=65 This community type represents an Aspen/Rose - Low-bush cranberry/ Tall Forb which has been moderately grazed. As a result, the tall native forb and shrub layer has been reduced in richness and diversity while low-growing forbs such as Strawberry, Common Pink Wintergreen, and Bunchberry has increased.

This community type has not been grazed as heavily as communities predominated by clover as native forbs and grass still predominate. However, the forage production is reduced due to the reduction in tall native forbs that are found in the undisturbed community (e7 Aw/Rose-Low-bush Cranberry/Tall Forbs). This is still primary range for domestic livestock, however, in order to maintain native species diversity and richness Suggested Grazing levels are lowered.

PLANT COMPOSITION	CANOPY COVER(%) MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	56	25-90	100
BALSAM POPLAR *(Populus balsamifera)*	4	0-20	50
SHRUBS			
ROSE *(Rosa acicularis)*	17	5-42	100
RASPBERRY *(Rubus idaeus)*	5	0-30	66
LOW-BUSH CRANBERRY *(Viburum edule)*	2	0-12	63
BRACTED HONEYSUCKLE *(Lonicera involucrata)*	1	0-3	55
FORBS			
STRAWBERRY *(Fragaria virginiana)*	6	1-32	100
CREAM-COLORED VETCHLING *(Lathyrus ochroleucus)*	4	0-17	99
BUNCHBERRY *(Cornus canadensis)*	7	0-18	92
COMMON PINK WINTERGREEN *(Pyrola asarifolia)*	4	0-19	92
NORTHERN BEDSTRAW *(Galium boreale)*	2	0-4	92
DEWBERRY *(Rubus pubescens)*	4	0-14	80
TALL LUNGWORT *(Mertensia paniculata)*	3	0-15	77
DANDELION *(Taraxacum officinale)*	1	0-6	62
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	8	0-40	92
HAIRY WILD RYE *(Elymus innovatus)*	4	0-33	77

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: MESOTROPHIC

SOIL DRAINAGE: WELL

ELEVATION: 932 M (572 -1219 M)

SLOPE: 5 % (1-30%)

ASPECT: SOUTHERLY

FORAGE PRODUCTION IN KG/HA N=44

GRASS	356 (12-1652)
FORBS	360 (50-1066)
SHRUBS	182 (0-920)
TOTAL	898 (220-2522)

SUGGESTED GRAZING
2.0 HA/AUM

g3: Aspen/ Rose/ Clover

(Populus tremuloides/ Rosa acicularis/ Trifolium repens)

n=21 This community type represents an Aspen/ Rose-Low-bush Cranberry/ Tall Forb which has been heavily grazed. The richness and diversity of the native shrubs and forbs has been reduced and replaced with clover and dandelion invading the site. The predominance of clover indicates heavy grazing pressure and, is believed, to indicate a slightly drier moisture regime compared to the sites dominated by kentucky bluegrass. As a result of grazing and site conditions forage production has considerably declined from the modal Aspen/ Rose-Low-bush Cranberry/ Tall Forb community type and thereby Suggested Grazing levels is also lowered.

It is presently unclear whether this community type can revert back to its modal undisturbed condition by restricting grazing. Monitoring an Aw/Rose/Clover, restricted from grazing, over the past 10 years has not changed its species composition.

PLANT COMPOSITION	CANOPY COVER(%)		
	MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	56	20-90	100
BALSAM POPLAR *(Populus balsamifera)*	5	0-20	48
WHITE SPRUCE *(Picea glauca)*	2	0-10	48
SHRUBS			
ROSE *(Rosa acicularis)*	11	3-36	100
SNOWBERRY OR BUCKBRUSH *(Symphoricapos occidentalis)*	2	0-8	67
BUFFALO-BERRY *(Shepherdia canadensis)*	2	0-11	52
RASPBERRY *(Rubus idaeus)*	2	0-12	38
FORBS			
CLOVER *(Trifolium spp.)*	19	3-35	100
STRAWBERRY *(Fragaria virginiana)*	3	0-7	92
COMMON PINK WINTERGREEN *(Pyrola asarifolia)*	3	0-12	90
CREAM-COLOURED VETCHLING *(Lathyrus ochroleucus)*	2	0-9	90
BUNCHBERRY *(Cornus canadensis)*	4	0-13	86
LINDLEY'S ASTER *(Aster ciliolatus)*	3	0-17	86
COMMON DANDELION *(Taraxacum officinale)*	2	0-6	86
GRASSES			
HAIRY WILD RYE *(Elymus innovatus)*	3	0-23	76
KENTUCKY BLUEGRASS *(Poa pratensis)*	3	0-19	52
PURPLE OAT GRASS *(Schizachne purpurascens)*	2	0-18	48

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: MESOTROPHIC

SOIL DRAINAGE: WELL

ELEVATION: 915 M (824-1151 M)

SLOPE: 5-9%

ASPECT: SOUTHERLY

FORAGE PRODUCTION IN KG/HA: N=13

GRASS	154 (32-596)
FORBS	414 (126-1228)
SHRUBS	152 (30-480)
TOTAL	720 (210-1674)

SUGGESTED GRAZING
2.0 HA/AUM

g4: Aspen/ Kentucky Bluegrass/ Clover

(Populus tremuloides/ Poa pratensis/ Trifolium repens)

n=29 This community type is representative of an Aspen/ Rose - Low-bush Cranberry/ Tall Forb which has received prolonged heavy grazing. This c.t. often occurs in relatively small isolated patches created by intensive grazing adjacent to water, salt, or tempory holding areas. The species richness and diversity of native shrubs, forbs, and grass is reduced and replaced by grazing resistant clover, dandelion, and kentucky bluegrass.

The change in species composition reduced forage production for the two previous community type, i.e. Aw/Rose/Strawberry and Aw/Rose/Clover, however this c.t. has noticeabily greater forage production even when compared to the undisturbed modal c.t. (Aw/Rose - Low-bush Cranberry/ Tall Forbs at 957 kg/ha). It is believed that kentucky bluegrass will increase with prolonged heavy grazing regimes on sites with relatively higher moisture/nutrient regimes, and thereby the higher forage production. It is recommended that a more conservation level of grazing be utilized to restore native plant species, although it is unclear whether an Aspen understory invaded with kentucky bluegrass can ever be restored to its previous undisturbed community.

PLANT COMPOSITION	CANOPY COVER(%) MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	55	0-90	100
SHRUBS			
ROSE *(Rosa acicularis)*	6	0-44	76
RASPBERRY *(Rubus idaeus)*	3	0-23	41
FORBS			
CLOVER *(Trifolium spp.)*	22	2-84	100
COMMON DANDELION *(Taraxacum officinale)*	10	0-37	90
STRAWBERRY *(Fragaria virginiana)*	7	0-24	90
CREAM-COLOURED VETCHLING *(Lathyrus ochroleucus)*	3	0-22	72
LINDLEY'S ASTER *(Aster ciliolatus)*	4	0-16	62
BUNCHBERRY *(Cornus canadensis)*	3	0-13	55
GRASSES			
KENTUCKY BLUEGRASS *(Poa pratensis)*	22	0-88	93
MARSH REED GRASS *(Calamagrostis canadensis)*	4	0-24	66
HAIRY WILD RYE *(Elymus innovatus)*	4	0-32	66
PURPLE OAT GRASS *(Schizachne purpurascens)*	6	0-25	62

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: MESOTROPHIC

SOIL DRAINAGE: WELL

ELEVATION: 1090 M (818 - 1280 M)

SLOPE: 3-7 %

ASPECT: SOUTHERLY

FORAGE PRODUCTION IN KG/HA: N=18

GRASS	681 (76-1817)
FORBS	380 (0-959)
SHRUBS	117 (0-753)
TOTAL	1178 (291-2776)

SUGGESTED GRAZING
2.0 HA/AUM

MIXEDWOOD FOREST COMMUNITY TYPES

OF THE

LOWER FOOTHILLS SUBREGION

Photo 13: A typical mixedwood stand within the Lower Foothills subregion. These stands develop as an aspen forest begins to succeed towards a conifer-dominated climax community type. As this stand succeeds toward climax and spruce becomes dominant, the canopy becomes closed and understory production decreases.

MIXEDWOOD FORESTS

The mixedwood forest community types within the Lower Foothills subregion occur as either a mixture of white spruce or lodgepole pine and deciduous (usually aspen) trees. The sites where the different mixedwood community types occur are determined by moisture and soil nutrient regime. The white spruce-deciduous community types usually occur on finer textured soils that have good soil drainage, while the lodgepole pine-deciduous community types usually occur on coarser textured soils with poorer nutrients.

The white spruce-deciduous community type that occurs most often (the modal c.t.) throughout the Lower Foothills subregion on ungrazed sites is the Aspen-White Spruce/Rose/Forb community type described as Aw-Sw-Pl/prickly rose or Aw-Sw-Pl/low-bush cranberry by Beckingham et al (1996). Grazing this c.t. can cause a decline in tall forbs, i.e. fireweed, wild sarsaparilla, cream-colored vetchling creating a new community type dominanted by low-growing forbs Aspen/Rose/Clover. Sites that are drier (either because of rapid drainage or exposure) than the modal white spruce-deciduous type support Aspen-White spruce/Buffalo-berry-Bearberry, Aw-Sw/Buffalo-berry or Pb-Sw/Chokecherry-Bearberry (upland seepage) community types. While sites that are wetter than the modal c.t. support Aspen-Balsam Poplar-White spruce/Alder, and Aspen-White Spruce-Balsam Poplar/Bracted honeysuckle community types. As white spruce begins to dominate the overstory and exert more shading influences on the understory vegetation a later seral White Spruce-Aspen/Low Forb community type will predominate and continue to develop to a climax White Spruce (Balsam Fir)/Feathermoss c.t. on most of the sites described above. Figure 12 illustrates the relationships that these community types have to one another.

The lodgepole pine-deciduous community types seem to occur along a gradient of soil moisture and nutrient regime. The Lodgepole Pine-White Spruce-Aspen/Labrador tea/Feathermoss community type seems to occur under the poorest soil nutrient conditions (mesic/poor). The higher cover of Labrador tea may indicate slightly more acidic soils (Beckingham et al 1996). Under slightly drier soil moisture and higher soil nutrient conditions Logdepole Pine-Aspen/Buffalo-berry and Lodgepole Pine-White Spruce-Aspen/Rose/Hairy Wild Rye are apparent on the lower scale of a mesic(or submesic)/medium grid. The Lodgepole Pine-Aspen/Forb/Marsh Reedgrass community type occupies sites on typical mesic moisture and medium nutrient regimes. These better growth conditions result in a better developed understory and higher forage productivity. The Logdepole pine-Aspen/Alder dominated community type are also found on mesic/medium sites. However, the presence of alder may indicate higher elevation sites in the upland ecodistricts or an impermeable soil layer that permits higher soil moisture availability. Upland seepage areas may also consist of Aspen-Lodgepole Pine-White Spruce/Snowberry community types. Figure 13 illustrates the relationships that these community types have with one another.

Table 10. Forage production summary of mixedwood forest community types within the Lower Foothills subregion

	Community number	Community type	Productivity (kg/ha)				sample size (n)	Carrying capacity (ha/AUM)
			Grass	Forb	Shrub	Total		
b bearberry/ lichen submesic/ poor	**Ecosite phase**	**b1 bearberry Aw-Sw-Pl**	**60**	**334**	**318**	**712**	**1**	**2.6**
	h1	Pb-Sw/chokecherry-bearberry	60	334	318	712	1	2.6
c hairy wild rye submesic/ medium	**Ecosite phase**	**c3 hairy wild rye Aw-Sw-Pl**	**258**	**180**	**120**	**558**	**2**	**3.3**
	h2	Aw-Sw/buffalo-berry/bearberry	258	180	120	558	2	3.3
	Ecosite phase	**c3_harvest**	**1786**	**111**	**232**	**2129**	**2**	**3.3**
	12	Aw/hairy wild rye/dwarf bilberry-labrador tea	1786	111	232	2129	2	3.3
d labrador tea - mesic mesic/poor	**Ecosite phase**	**d3 labrador tea - mesic Aw-Sw-Pl**	**220**	**225**	**193**	**637**	**14**	**2.9**
	h3	Pl-Sw-Aw/labrador tea/feathermoss	220	225	193	637	14	2.9
e low-bush cranberry mesic/ medium	**Ecosite phase**	**e3 low-bush cranberry Aw-Sw-Pl**	**195**	**345**	**210**	**750**	**69**	**2.4**
	h4	Aw-Sw/buffalo-berry	115	402	223	739	7	2.5
	h5	Aw-Pl/buffalo-berry	61	311	196	568	2	3.2

	Community number	Community type	Productivity (kg/ha)				sample size (n)	Carrying capacity (ha/AUM)
			Grass	Forb	Shrub	Total		
	h6	Aw-Pl/alder	58	334	428	820	4	2.2
	h7	Aw-Pb-Sw/alder	171	253	189	613	3	3.0
	h8	Pl-Aw/forb/marsh reedgrass	200	500	100	800	1	2.3
	h9	Aw-Sw/rose/forb	237	360	183	781	42	2.3
	h10	Pl-Sw-Aw/rose/hairy wild rye	319	288	210	816	3	2.2
	h11	Aw-Pl-Sw/snowberry	144	216	531	891	2	2.0
	Ecosite phase	**e3_grazed**	**161**	**220**	**115**	**496**	**2**	**3.7**
	i1	Aw-Sw/clover	161	220	115	496	2	3.7
	Ecosite phase	**e3_harvest**	**240**	**116**	**1400**	**1756**	**1**	**2.4**
	l8	Aw/willow/purple oatgrass/dwarf bilberry	240	116	1400	1756	1	2.4
	Ecosite phase	**e3_harvest_grazed**	**3090**	**658**	**322**	**4070**	**1**	**2.4**
	m5	clover/timothy/buffalo-berry/Pl-Sw	3090	658	322	4070	1	2.4
f bracted honeysuckle subhygric/ rich	**Ecosite phase**	**f3 bracted honeysuckle Aw-Sw-Pl**	**1490**	**352**	**172**	**2014**	**1**	**0.9**
	h12	Aw-Sw-Pb/bracted honeysuckle	n/a	n/a	n/a	900*	0	2.0
	Ecosite phase	**f3_harvest Aw-Sw-Pl**	**325**	**1210**	**1075**	**2610**	**2**	**2.0**

Community number	Community type	Productivity (kg/ha)				sample size (n)	Carrying capacity (ha/AUM)
		Grass	Forb	Shrub	Total		
114	fireweed/green alder/Pl-Sw	325	1210	1075	2610	2	2.0

* estimated production.

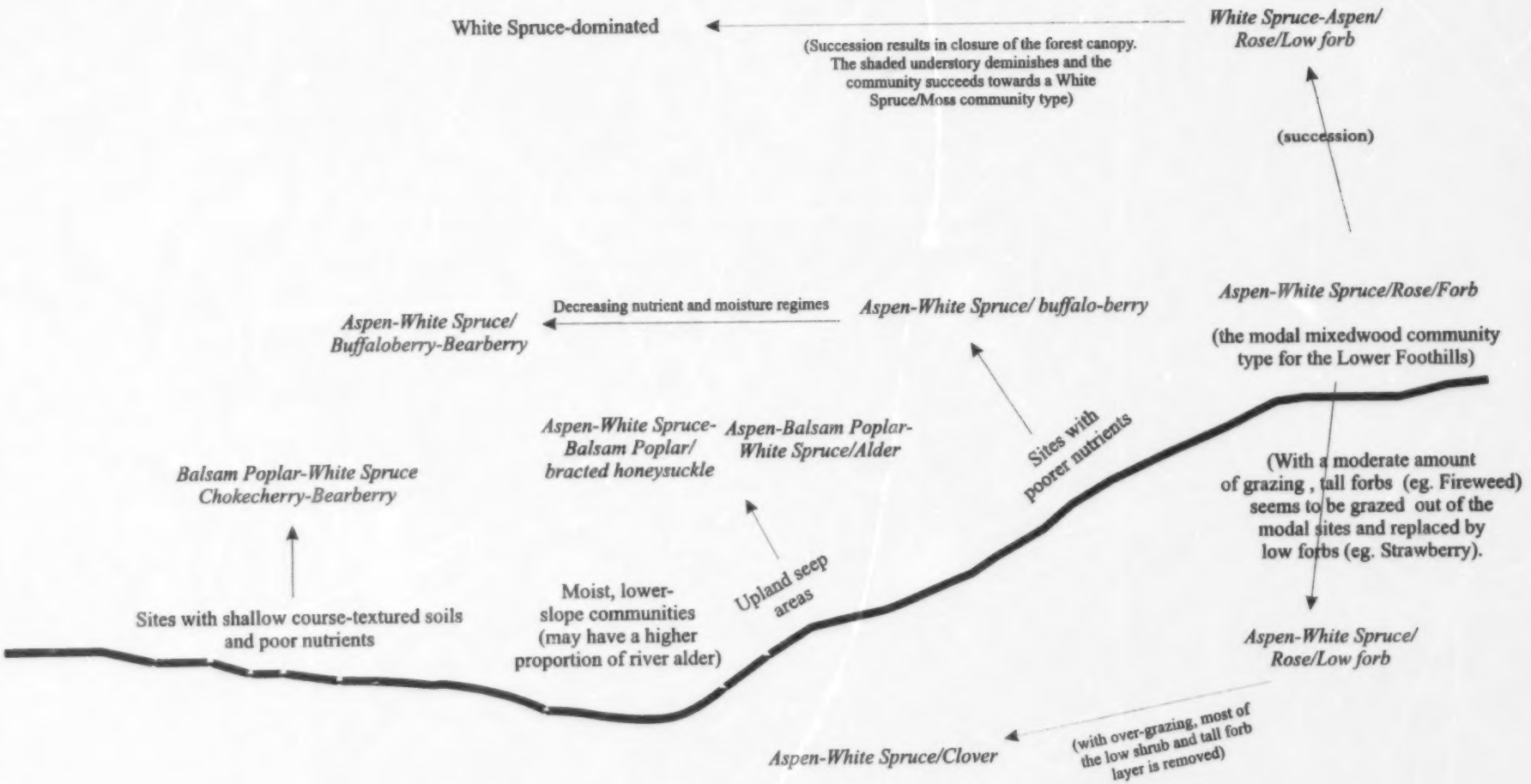

White Spruce-dominated
(Succession results in closure of the forest canopy. The shaded understory deminishes and the community succeeds towards a White Spruce/Moss community type)
White Spruce-Aspen/ Rose/Low forb
(succession)
Aspen-White Spruce/Rose/Forb
(the modal mixedwood community type for the Lower Foothills)
Decreasing nutrient and moisture regimes
Aspen-White Spruce/ Buffaloberry-Bearberry
Aspen-White Spruce/ buffalo-berry
Sites with poorer nutrients
Aspen-White Spruce-Balsam Poplar/ bracted honeysuckle
Aspen-Balsam Poplar-White Spruce/Alder
Balsam Poplar-White Spruce Chokecherry-Bearberry
(With a moderate amount of grazing , tall forbs (eg. Fireweed) seems to be grazed out of the modal sites and replaced by low forbs (eg. Strawberry).
Upland seep areas
Moist, lower-slope communities (may have a higher proportion of river alder)
Sites with shallow course-textured soils and poor nutrients
Aspen-White Spruce/ Rose/Low forb
(with over-grazing, most of the low shrub and tall forb layer is removed)
Aspen-White Spruce/Clover

Figure 12: Landscape profile of spruce-dominated mixedwood community types of the Lower Foothills Subregion

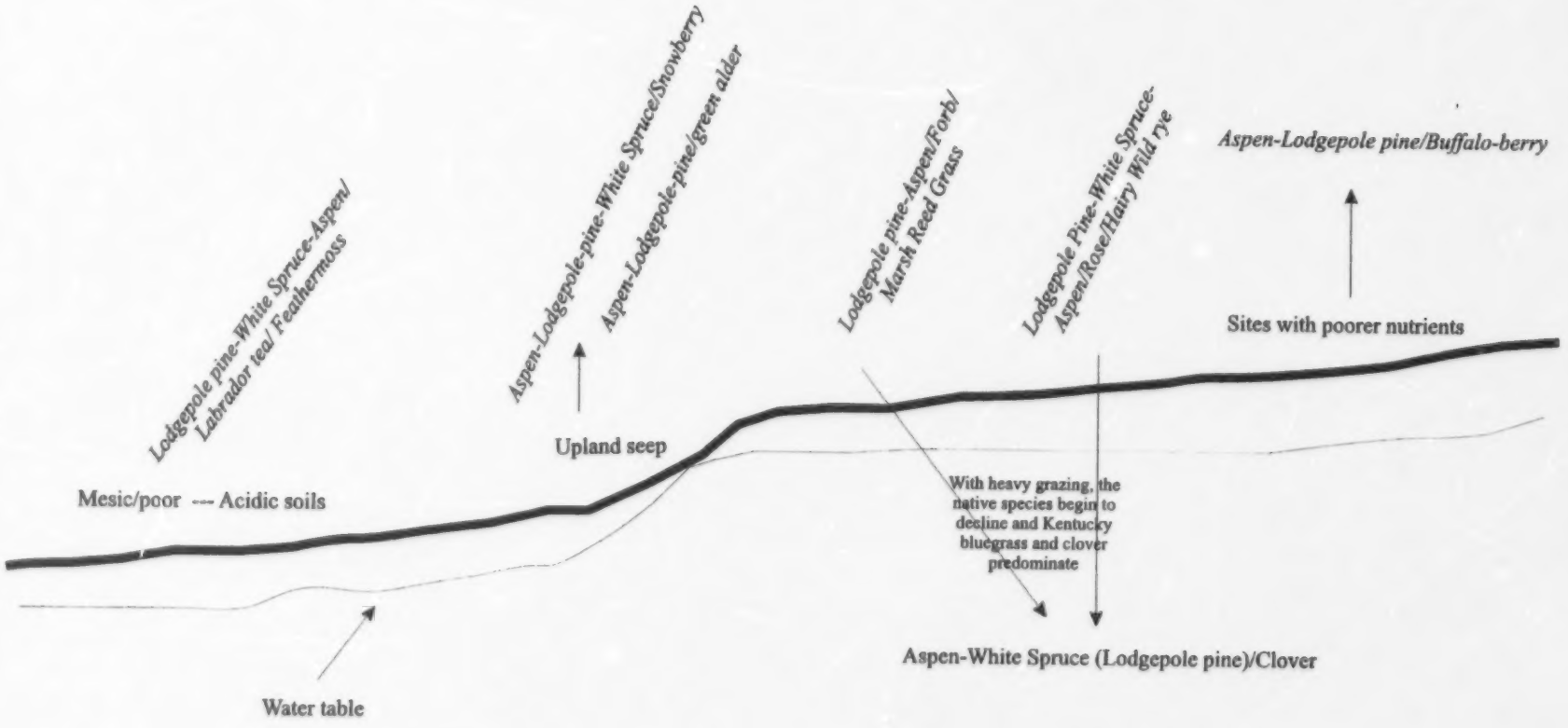

Lodgepole pine-White Spruce-Aspen/ Labrador tea/ Feathermoss
Aspen-Lodgepole-pine-White Spruce/Snowberry
Aspen-Lodgepole-pine/green alder
Lodgepole pine-Aspen/Forb/ Marsh Reed Grass
Lodgepole Pine-White Spruce-Aspen/Rose/Hairy Wild rye
Aspen-Lodgepole pine/Buffalo-berry
Sites with poorer nutrients
Upland seep
Mesic/poor --- Acidic soils
With heavy grazing, the native species begin to decline and Kentucky bluegrass and clover predominate
Aspen-White Spruce (Lodgepole pine)/Clover
Water table

Figure 13: Landscape profile of pine-dominated mixedwood community types of the Lower Foothills Subregion

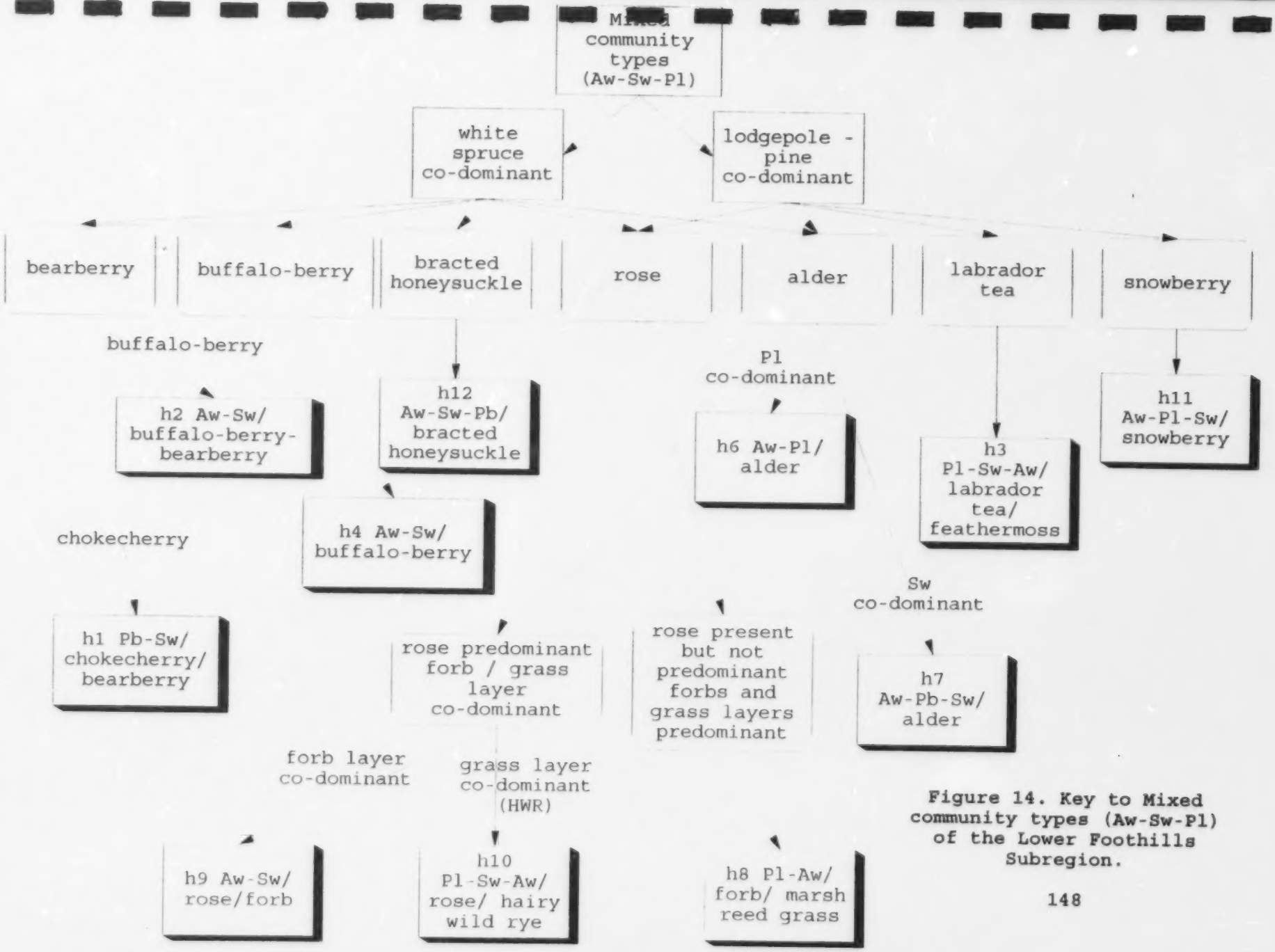


Figure 14. Key to Mixed community types (Aw-Sw-Pl) of the Lower Foothills Subregion.

h1: Balsam Poplar- White Spruce/ Chokecherry- Bearberry

(Populus balsamifera- Picea glauca/ Prunus viginiana- Arctostaphylos uva-ursi)

n=1 This community type was found on a fluvial outwash between Brule Lake and Ogre Canyon on shallow, poor nutrient soils. The presence of Balsam Poplar and White Spruce indicates moisture availiability, however, the dominance of bearberry and chokecherry suggests drier, poorer nutrient conditions. This species diversity indicates a fluctuating soil moisture conditions, perhaps created from periodic flooding from spring run-off.

This creates secondary range for domestic grazing with moderate forage production and dense shrub cover, however summer grazing by local horses are adapted to these, less than favourable, grazing conditions.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
BALSAM POPLAR *(Populus balsamifera)*	25	-	100
WHITE SPRUCE *(Picea glauca)*	20	-	100
PAPER BIRCH *(Betula papyrifera)*	10	-	100
SHRUBS			
CHOKECHERRY *(Prunus virginiana)*	26	-	100
BEARBERRY *(Arctostaphylos uva-ursi)*	16	-	100
RIVER BIRCH *(Betula occidentalis)*	5	-	100
SASKATOON *(Amelanchier alnifolia)*	5	-	100
ROSE *(Rosa acicularis)*	3	-	100
SNOWBERRY *(Symphoricarpos occidentalis)*	3	-	100
FORBS			
EARLY BLUE VIOLET *(Viola adunca)*	6	-	100
SHOWY LOCOWEED *(Oxytropis splendens)*	4	-	100
STAR-FLOWERED SOLOMON'S-SEAL *(Smilacina stellata)*	3	-	100
YELLOW HEDYSARUM *(Hedysarum sulphurescens)*	2	-	100
GRASSES			
SEDGES *(Carex spp.)*	11	-	100
SHEEP FESCUE *(Festuca saximontana)*	5	-	100
SLENDER WHEAT GRASS *(Agropyron trachycaulum)*	4	-	100
ALPINE BLUE GRASS *(Poa alpina)*	3	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBMESIC
NUTRIENT REGIME:
MESOTROPHIC
SOIL DRAINAGE:
RAPIDLY
ELEVATION:
1050M
SLOPE: 2%

FORAGE PRODUCTION (KG/HA)

GRASS	60
FORBS	334
SHRUBS	318
TOTAL	712

SUGGESTED GRAZING
2.6 HA/AUM

h2: Aspen- White Spruce/ Buffaloberry- Bearberry

*(Populus tremuloides - Picea glauca/ Shepherdia canadensis- Arctostaphylos uva-*ursi*)*

n=3 This community type resembles the Aw-Sw-Pl/Buffalo-berry community type described by Beckingham (1994) and is part of the low-bush cranberry ecosite described by Beckingham et al (1996) . It has the driest and the poorest nutrients of any community type within the mesic ecosites.

Since this community type has a low cover of conifer overstory, it still has a productive understory and is useful for grazing. Its importance as a source of forage mainly depends on how close it is to features that attract livestock (ie. water,grasslands, salt, trails, etc.). If it is close to an area that attracts livestock it will contribute to the carrying capacity of a lease. If it is not close to an area that attracts livestock, management strategies will have to be implemented before it will contribute to the carrying capacity of an area.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	45	30-75	100
WHITE SPRUCE *(Picea glauca)*	22	20-25	100
SHRUBS			
BUFFALOBERRY *(Shepherdia canadensis)*	21	13-29	100
BEARBERRY *(Arctostaphylos uva-ursi)*	10	0-25	68
ROSE *(Rosa acicularis)*	10	7-15	100
TWIN-FLOWER *(Linnaea borealis)*	7	0-17	68
FORBS			
STRAWBERRY *(Fragaria virginiana)*	8	1-20	100
LINDLEY'S ASTER *(Aster ciliolatus)*	4	3-6	100
FIREWEED *(Epilobium angustifolium)*	2	1-2	100
NORTHERN BEDSTRAW (*Galium boreale*)	2	1-2	100
CREAM-COLOURED VETCHLING (PEAVINE) *(Lathyrus ochroleucus)*	2	0-4	68
ALPINE HEDYSARUM *(Hedysarum alpinum)*	1	1-2	67
COMMON RED PAINTBRUSH *(Castilleja miniata)*	3	0-6	67
AMERICAN VETCH *(Vicia americana)*	1	1	67
COMMON YARROW *(Achillea millefolium)*	1	0-2	67
GRASSES			
HAIRY WILD RYE *(Elymus innovatus)*	13	6-25	100
SEDGES (*Carex spp.*)	2	2-4	68
MOSSES			
Moss spp.	18	1-41	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBHYGRIC
NUTRIENT REGIME:
MESOTROPHIC
SOIL DRAINAGE:
WELL
ELEVATION (MEAN):
900 - 1100 (1000)M
SLOPE: N/A

FORAGE PRODUCTION (KG/HA) n=2

GRASS	258 (44-472)
FORBS	180 (90-270)
SHRUBS	120 (114-126)
TOTAL	558 (260-856)

SUGGESTED GRAZING
3.3 HA/AUM

h3: Lodgepole Pine- White Spruce- Aspen/ Labrador Tea/ Feathermoss

(Pinus contorta- Picea glauca- Populus tremuloides/ Ledum groenlandicum/ Moss spp.)

n=22 This community type corresponds to Beckingham's (1994) Pl-Aw-/Shrub ecosite phase and is part of the labrador tea -mesic ecosite (Archibald et al 1996). It is fairly dry and low in nutrients and more acidic soils relative to the modal for the Lower Foothills.

This community type does not produce much palatable forage and is non-use. If it occurs fairly close to an area that is primary range it will get used and could be considered as secondary range.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
LODGEPOLE PINE *(Pinus contorta)*	32	10-75	100
ASPEN *(Populus tremuloides)*	25	4-65	100
WHITE SPRUCE *(Picea glauca)*	16	0-60	86
SHRUBS			
LABRADOR TEA *(Ledum groenlandicum)*	11	0-33	96
ROSE *(Rosa acicularis)*	5	0-12	86
BOG CRANBERRY *(Vaccinium vitis-idaea)*	7	0-39	77
BLUEBERRY OR WHORTLEBERRY *(Vaccinium myrtilloides)*	5	0-26	68
BUFFALOBERRY *(Shepherdia canadensis)*	3	0-9	55
FORBS			
TWINFLOWER *(Linnaea borealis)*	13	0-53	96
BUNCHBERRY *(Cornus canadensis)*	12	0-31	100
STRAWBERRY *(Fragaria virginiana)*	4	0-12	100
CREAM-COLOURED VETCHLING (PEAVINE) *(Lathyrus ochroleucus)*	4	0-12	86
WILD LILY-OF-THE-VALLEY *(Maianthemum canadense)*	3	0-8	91
PALMATE-LEAVED COLTSFOOT *(Petasites palmatus)*	3	0-8	68
DEWBERRY OR RUNNING RASPBERRY *(Rubus pubescens)*	2	0-10	64
GRASSES			
HAIRY WILD RYE *(Elymus innovatus)*	7	0-38	86
MARSH REED GRASS *(Calamagrostis canadensis)*	4	0-18	86
WHITE-GRAINED MOUNTAIN RICE GRASS *(Oryzopsis asperifolia)*	3	0-17	86
PURPLE OAT GRASS *(Schizachne purpurascens)*	2	0-6	59
MOSSES			
Moss spp.	40	0-92	77

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBMESIC TO MESIC
NUTRIENT REGIME:
MESOTROPHIC
SOIL DRAINAGE:
WELL TO MODERATELY WELL
ELEVATION (MEAN):
792 - 1572 (1009)M
SLOPE: 0 - 4%

FORAGE PRODUCTION (KG/HA) N=14

GRASS	220 (10-524)
FORBS	225 (50-514)
SHRUBS	193 (0-578)
TOTAL	637 (70-1304)

SUGGESTED GRAZING
2.9 HA/AUM

h4: Aspen- White Spruce/ Buffaloberry

(Populus tremuloides- Picea glauca/ Shepherdia canadensis)

n=9 This community type occupies similar sites to the Aw/Buffalo-berry community type, but is successionally more advanced and slightly drier than the modal Aw/rose-low bush cranberry community type . As white spruce increases, the abundance of tall forbs declines as they are replaced by low-growing, shade-tolerant species. As the tall forb layer declines, so does the productivity of the site. Eventually this community type will succeed to a Sw/moss or a Sw/Horsetail/Moss community type on moister sites. The climax communities are non-use for domestic livestock.

PLANT COMPOSITION

	CANOPY COVER(%) MEAN	RANGE	CONST.
TREES			
WHITE SPRUCE *(Picea glauca)*	19	10-35	100
ASPEN *(Populus tremuloides)*	38	8-65	100
BALSAM POPLAR *(Populus balsamifera)*	13	0-10	44
SHRUBS			
ROSE *(Rosa acicularis)*	14	5-25	100
BUFFALOBERRY *(Shepherdia canadensis)*	12	2-25	100
TWINFLOWER *(Linnaea borealis)*	7	1-13	100
LOW-BUSH CRANBERRY *(Viburnum edule)*	3	0-13	100
BRACTED HONEYSUCKLE *(Lonicera involucrata)*	3	0-10	78
BOG CRANBERRY *(Vaccinium vitis-idaea)*	3	0-12	44
WHITE MEADOWSWEET *(Spriraea betulifolia)*	3	0-13	33
FORBS			
BUNCHBERRY *(Cornus canadensis)*	9	5-13	100
FIREWEED *(Epilobium angustifolium)*	6	0-16	100
CREAM-COLOURED VETCHLING (PEAVINE) *(Lathyrus ochroleucus)*	5	1-13	100
PALMATED COLTSFOOT *(Petasites palmatus)*	4	1-7	100
COMMON PINK WINTERGREEN *(Pyrola asarifolia)*	3	0-4	100
STRAWBERRY *(Fragaria virginiana)*	2	0-5	89
LINDELY'S ASTER *(Aster ciliolatus)*	3	0-6	78
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	5	1-11	100
HAIRY WILD RYE *(Elymus innovatus)*	3	0-6	67

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC TO SUBHYGRIC
NUTRIENT REGIME:
MESOTROPHIC
SOIL DRAINAGE:
WELL TO MODERATELY WELL
ELEVATION (MEAN):
745 - 899 (806)M
SLOPE: 1-8%

FORAGE PRODUCTION (KG/HA) n=7

GRASS	115 (12-356)
FORBS	402 (150-796)
SHRUBS	223 (76-480)
TOTAL	739 (422-1070)

SUGGESTED GRAZING
2.5 HA/AUM

h5: Aspen- Lodgepole Pine/ Buffalo-berry

(Populus tremuloides- Pinus contorta/ Shepherdia canadensis)

n=2 This community type is similar to Aw-Sw-Pl/buffalo-berry/hairy wild rye described by Beckingham et al (1996). The prominence of aspen indicates that it is relative early succession as lodgepole pine and later white spruce will begin to dominant with later succession stands. The diversity of shrubs has restricted the herbaceous growth to low forbs with little grass cover.

This community type does not produce very much palatable forage in its present state and is expected to produce less as white spruce exerts more dominance over the site. Therefore, this community type is considered to be non-use or, at best, secondary range for grazing. Even though this community type will not produce much forage, it may provide some cover for the livestock to escape from the sun, wind, or rain.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
LODGEPOLE PINE *(Pinus contorta)*	15	15-15	100
TREMBLING ASPEN *(Populus tremuloides)*	28	25-30	100
WHITE SPRUCE *(Picea glauca)*	3	2-3	100
SHRUBS			
ROSE *(Rosa acicularis)*	11	3-19	100
BUFFALOBERRY *(Shepherdia canadensis)*	10	2-17	100
TWIN-FLOWER *(Linnaea borealis)*	6	3-9	100
WILLOW *(Salix bebbiana)*	5	2-7	100
LOW-BUSH CRANBERRY *(Viburnum edule)*	2	1-3	100
DWARF BILBERRY *(Vaccinium caespitosum)*	2	1-2	100
FORBS			
BUNCHBERRY *(Cornus canadensis)*	13	9-17	100
STRAWBERRY *(Fragaria virginiana)*	3	0-4	100
CREAM-COLOURED VETCHLING (PEAVINE) *(Lathyrus ochroleucus)*	3	2-2	100
COMMON PINK WINTERGREEN *(Pyrola asarifolia)*	6	5-5	100
GRASSES			
MARSH REEDGRASS *(Calamagrostis canadensis)*	4	2-4	100
HAIRY WILD RYE *(Elymus innovatus)*	1	0-1	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC
NUTRIENT REGIME:
MESOTROPHIC
SOIL DRAINAGE:
MODERATELY WELL
ELEVATION (MEAN):
613-643 (628)M

FORAGE PRODUCTION (KG/HA) N=2

GRASS	61 (58-64)
FORBS	311 (276-346)
SHRUBS	196 (2-390)
TOTAL	568 (406-730)

SUGGESTED GRAZING
3.2 HA/AUM

h6: Aspen-Lodgepole Pine/Alder

(Populus tremuloides - Pinus contorta/ Alnus crispa)

n=10 This community type occurs on fairly coarse, moderately well drained parent material. It corresponds to Aw-Sw-Pl/green alder (Beckingham et al 1996) and is thought to represent a transition from the modal aspen to the dry lodgepole pine dominated types in the Upper Foothills Subregion. He also felt that the presence of white spruce in the canopy suggests succession to Sw/ Feathermoss or Sw - Fb/ Feathermoss associations if white spruce density is high or a Sw/ Vibu edu/ Feathermoss association if white spruce density is low. The presence of green alder indicates a slightly higher moisture availability, compared to the modal, likely created by an inpermeable soil layer.

Generally, this community type is not useful for livestock grazing because it does not produce good quality forage. However, it may be useful for providing protection to livestock from the sun, wind, or rain.

PLANT COMPOSITION

	CANOPY COVER(%) MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	29	1-40	100
LODGEPOLE PINE *(Pinus contorta)*	17	4-30	100
WHITE SPRUCE *(Picea glauca)*	7	0-10	70
SHRUBS			
GREEN ALDER *(Alnus crispa)*	27	2-70	100
ROSE *(Rosa acicularis)*	5	1-12	100
LOW BUSH CRANBERRY *(Viburnum edule)*	5	0-20	80
WHITE MEADOWSWEET *(Spriraea betulifolia)*	4	0-18	60
FORBS			
BUNCHBERRY *(Cornus canadensis)*	21	2-97	100
DEWBERRY OR RUNNING RASPBERRY *(Rubus pubescens)*	7	1-17	100
COMMON PINK WINTERGREEN *(Pyrola asarifolia)*	5	0-20	100
TALL LUNGWORT (BLUEBELLS) *(Mertensia paniculata)*	2	0-5	100
TWINFLOWER *(Linnaea borealis)*	7	0-25	80
BISHOP'S-CAP *(Mitella nuda)*	5	0-16	80
FIREWEED *(Epilobium angustifolium)*	5	0-18	80
STRAWBERRY *(Fragaria virginiana)*	3	0-15	80
WILD SARSAPARILLA *(Aralia nudicaulis)*	13	0-44	70
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	5	1-14	100
HAIRY WILD RYE *(Elymus innovatus)*	2	0-16	40

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC
NUTRIENT REGIME:
MESOTROPHIC
SOIL DRAINAGE:
WELL TO MODERATELY WELL
ELEVATION (MEAN):
868 - 1240 (1042)M
SLOPE: 0 - 12%

FORAGE PRODUCTION (KG/HA) n=4

GRASS	58 (18-112)
FORBS	334 (166-628)
SHRUBS	428 (102-825)
TOTAL	820 (364-1295)

SUGGESTED GRAZING
2.2 HA/AUM

h7: Aspen - Balsam Poplar-White Spruce/ Alder

(Populus tremuloides - Populus balsamifera-Picea glauca/ Alnus spp.)

n=9 This community type represents an Aw-Pb/Alder/Marsh reed grass community that is undergoing succession towards a white spruce-dominated canopy. Beckingham (1993) described the succession of a similar community type, his Pb-Aw/Green Alder type. Beckingham stated that the density of spruce in the climax canopy determines if the climax community will be in the Sw/Green Alder/Feathermoss or the Sw-Fb/Feathermoss association. This is because green alder has a low tolerance to shade. Therefore these communities tend to be fairly open. The presence of alder, wild sarsaparilla and a high cover of balsam poplar are indicative of the high soil moisture regime and nutrient content of this community. Abundance of river alder increases as you move to lower slope positions where soil moisture increases.

This community type does not produce much palatable forage in its present state and is expected to produce less as white spruce exerts more dominance over the site. Therefore this community is considered to be non-use or, at best, secondary range for livestock grazing. However, it will provide some cover for livestock and wildlife from the sun, wind or rain.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	33	15-70	100
WHITE SPRUCE *(Picea glauca)*	17	1-35	100
BALSAM POPLAR *(Populus balsamifera)*	9	0-35	50
SHRUBS			
ALDER *(Alnus crispa or tenuifolia)*	16	0-50	90
ROSE *(Rosa spp.)*	11	2-35	100
LOW BUSH CRANBERRY *(Viburnum edule)*	6	0-14	100
BRACTED HONEYSUCKLE *(Lonicera involucrata)*	3	0-7	70
BUFFALOBERRY *(Shepherdia canadensis)*	4	0-15	40
FORBS			
BUNCHBERRY *(Cornus canadensis)*	9	0-21	100
WILD SARSAPARILLA *(Aralia nudicaulis)*	12	0-75	40
FIREWEED *(Epilobium angustifolum)*	5	1-19	100
BISHOP'S-CAP *(Mitella nuda)*	3	0-6	100
DEWBERRY OR RUNNING RASPBERRY *(Rubus pubescens)*	5	0-12	90
COMMON PINK WINTERGREEN *(Pyrola asarifolia)*	4	0-12	90
PALMATE-LEAVED COLTSFOOT *(Petasites palmatus)*	3	0-6	90
STRAWBERRY *(Fragaria virginiana)*	3	0-8	80
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	8	0-35	90
HAIRY WILD RYE *(Elymus innovatus)*	4	0-21	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC TO SUBHYGRIC
NUTRIENT REGIME:
MESOTROPHIC
SOIL DRAINAGE:
MODERATELY WELL
ELEVATION (MEAN):
729 - 1220 (920)M
SLOPE: 0 - 15%

FORAGE PRODUCTION (KG/HA) n=3

GRASS	171 (60-256)
FORBS	253 (150-360)
SHRUBS	189 (18-366)
TOTAL	613 (366-798)

SUGGESTED GRAZING
3.0 HA/AUM

h8: Lodgepole Pine - Aspen/ Forb/ Marsh Reedgrass

(Pinus contorta -Populus tremuloides / Forb/ Calamagrostis canadensis)

n=3 This community type appears to represent the transition from an aspen to a pine dominated community. This community occurs on mesic well to moderately well drained nutrient medium sites. This community is similar to the Aw-Pl/ Low bush cranberry community type described by Beckingham (1993) and is part of the low-bush cranberry ecosite described by Beckingham et al (1996). The distinguishing factor of this community type is the predominance of tall growing forbs (fireweed, peavine, and occassionally wild sarsaparilla).

The forage production in this community type is normally good, but it is related to stand density. The majority of the vegetation in this community type is palatable to livestock, and when this community type is productive and accessible to livestock it would normally be considered as primary range. However if the canopy is closed and forage production is poor or if livestock access is limited this range may be considered secondary.

PLANT COMPOSITION	CANOPY COVER(%) MEAN	RANGE	CONST.
TREES			
LODGEPOLE PINE *(Pinus contorta)*	45	35-60	100
ASPEN *(Populus tremuloides)*	17	15-20	100
WHITE SPRUCE *(Picea glauca)*	6	2-10	100
SHRUBS			
WILLOW *(Salix spp.)*	5	0-10	100
BLUEBERRY OR WHORTLEBERRY *(Vaccinium myrtilloides)*	5	4-5	100
ROSE *(Rosa acicularis)*	2	0-4	67
BOG CRANBERRY *(Vaccinium vitis-idaea)*	2	0-4	67
FORBS			
CREAM - COLOURED VETCHLING (PEAVINE) *(Lathyrus ochroleucus)*	8	0-22	100
FIREWEED *(Epilobium angustifolium)*	7	2-12	100
WILD LILY-OF-THE-VALLEY *(Maianthemum canadense)*	5	1-7	100
TWIN-FLOWER *(Linnaea borealis)*	4	0-7	100
STRAWBERRY *(Fragaria virginiana)*	3	0-6	100
BUNCHBERRY *(Cornus canadensis)*	3	2-4	100
RUNNING RASPBERRY OR DEWBERRY *(Rubus pubescens)*	3	1-4	100
WILD SARSAPARILLA *(Aralia nudicaulis)*	4	0-12	33
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	9	2-21	100
HAIRY WILD RYE *(Elymus innovatus)*	5	0-11	67
PURPLE OAT GRASS *(Schizachne purpurascens)*	2	0-3	67
MOSSES			
Moss spp.	10	0-26	67

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBMESIC TO MESIC
NUTRIENT REGIME:
MESOTROPHIC TO PERMESOTROPHIC
SOIL DRAINAGE:
WELL
ELEVATION (MEAN):
660 - 1097 (941)M
SLOPE: 0 - 5 %
ASPECT: EASTERLY

FORAGE PRODUCTION (KG/HA) N=1

GRASS	200
FORBS	500
SHRUBS	100
TOTAL	800

SUGGESTED GRAZING
2.3 HA/AUM

h9: Aspen - White Spruce/ Rose/ Forb

(Populus tremuloides - Picea glauca/ Rosa acicularis/ Forb)

n=60 This community type is similar to the Aw/Rose/tall forb community type, but is successionally more advanced. As spruce succeeds into the canopy, it reduces the amount of light reaching the forest floor inhibiting the growth of shrubs, tall forbs and grass. Grazing can also reduce the tall forb component as low-growing forbs (strawberry, common pink wintergreen) will increase, and with continual grazing revert to clover and kentucky bluegrass (i1 Aw-Sw/clover --- characterized by lower forage production). Under natural succession this community will eventually revert to a Sw/moss on mesic/medium sites and Sw/horsetail/moss on higher moisture-nutrient sites.

This community type can provide secondary range for livestock but this is likely not sustainable with naturally and/or grazing succession.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
ASPEN			
(Populus tremuloides)	33	10-70	100
WHITE SPRUCE			
(Picea glauca)	25	0-80	98
SHRUBS			
ROSE			
(Rosa acicularis)	11	0-35	98
LOW BUSH CRANBERRY			
(Viburnum edule)	5	0-35	68
TWIN-FLOWER			
(Linnaea borealis)	7	0-21	87
BRACTED HONEYSUCKLE			
(Lonicera involucrata)	2	0-17	53
FORBS			
BUNCHBERRY			
(Cornus canadensis)	11	0-29	98
STRAWBERRY			
(Fragaria virginiana)	5	0-19	98
PALMATED COLTSFOOT			
(Petasites palmatus)	3	0-14	88
CREAM-COLOURED VETCHLING (PEAVINE)			
(Lathyrus ochroleucus)	5	0-21	87
COMMON PINK WINTERGREEN			
(Pyrola asarifolia)	3	0-15	85
RUNNING RASPBERRY OR DEWBERRY			
(Rubus pubescens)	4	0-30	83
LINDLEY'S ASTER			
(Aster ciliolatus)	3	0-18	82
GRASSES			
MARSH REED GRASS			
(Calamagrostis canadensis)	7	0-30	92
HAIRY WILD RYE			
(Elymus innovatus)	5	0-26	68

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC TO SUBHYGRIC
NUTRIENT REGIME:
MESOTROPHIC TO PERMESOTROPHIC
SOIL DRAINAGE:
WELL TO MODERATELY WELL
ELEVATION (MEAN):
671 - 1234 (916)M
SLOPE: 0 - 15%

FORAGE PRODUCTION (KG/HA) n=42

GRASS	237 (2-842)
FORBS	360 (10-892)
SHRUBS	183 (0-708)
TOTAL	781 (70-1870)

SUGGESTED GRAZING
2.3 HA/AUM

h10: Lodgepole Pine -White Spruce - Aspen/ Rose/ Hairy Wild Rye

(Pinus contorta - Picea glauca - Populus tremuloides/ Rosa acicularis/ Elymus innovatus)

n=7 This community type fits into Beckingham's (1994) Aw-Sw-Pl/ Shrub ecosite Phase and is part of the hairy wild rye or low-bush cranberry ecosites described by Beckingham et al (1996). It has developed under somewhat drier conditions, thus the predominance of lodgepole pine. As this community succeeds towards climax, aspen will be removed from the stand, and white spruce will eventually become dominant.

This community type is fairly productive and provides good grazing opportunities for domestic livestock. As the community succeeds towards maturity a closed canopy will develop and forage production will decline.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
WHITE SPRUCE *(Picea glauca)*	26	0-85	86
LODGEPOLE PINE *(Pinus contorta)*	19	0-50	86
TREMBLING ASPEN *(Populus tremuloides)*	15	4-25	100
SHRUBS			
TWIN-FLOWER *(Linnaea borealis)*	10	5-14	100
BUFFALO BERRY *(Shepherdia canadensis)*	7	0-10	100
PRICKLY ROSE *(Rosa acicularis)*	6	0-15	86
BOG CRANBERRY *(Vaccinium vitis-idaea)*	4	0-7	86
DWARF BILBERRY *(Vaccinium caespitosum)*	2	0-8	86
WILLOW *(Salix spp.)*	3	0-10	57
FORBS			
WILD STRAWBERRY *(Fragaria virginiana)*	6	2-11	100
BUNCHBERRY *(Cornus canadensis)*	6	2-14	100
LINDLEY'S ASTER *(Aster ciliolatus)*	6	0-13	86
FIREWEED *(Epilobium angustifolium)*	4	0-9	86
COMMON PINK WINTERGREEN *(Pyrola asarifolia)*	4	0-8	86
GRASSES			
HAIRY WILD RYE *(Elymus innovatus)*	12	3-21	100
MARSH REED GRASS *(Calamagrostis canadensis)*	5	0-12	86

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBMESIC TO MESIC
NUTRIENT REGIME:
MESOTROPHIC
SOIL DRAINAGE:
WELL
ELEVATION (MEAN):
1151- 1572 (1281)M
SLOPE: 0 - 20%

FORAGE PRODUCTION (KG/HA) N=3

GRASS	319 (68-842)
FORBS	288 (128-892)
SHRUBS	210 (54-708)
TOTAL	816 (582-1870)

SUGGESTED GRAZING
2.2 HA/AUM

h11: Aspen - Lodgepole Pine - White Spruce/ Snowberry

(Populus tremuloides - Pinus contorta - Picea glauca/ Symphoricarpos occidentalis)

n=2 This community type was found north of Hinton along the south banks of the Athabasca River. Upper slopes consisted of drier Sw-Pl stands, with higher moisture to down slope towards the river flat as indicated by the predominance of snowberry. The presence of aspen will eventually revert to a predominantly white spruce stand created by the moisture, which will lower understory species diversity and production.

Although this community has received some moderate level of grazing by the presence of kentucky bluegrass, it is considered secondary range, and will eventually revert to non-use grazing with natural succession.

PLANT COMPOSITION

	CANOPY COVER(%) MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	36	35-35	100
LODGEPOLE PINE *(Pinus contorta)*	10	0-20	50
JACK PINE *(Pinus banksiana)*	15	15-15	100
WHITE SPRUCE *(Picea glauca)*	13	10-15	100
SHRUBS			
ROSE *(Rosa acicularis)*	20	18-22	100
SNOWBERRY *(Symphoricarpos occidentalis)*	18	6-28	100
BUFFALOBERRY *(Shepherdia canadensis)*	4	1-6	100
TWINFLOWER *(Linnaea borealis)*	1	1-1	100
FORBS			
LINDLEY'S ASTER *(Aster ciliolatus)*	4	1-7	100
WILD STRAWBERRY *(Fragaria virginiana)*	3	2-3	100
CREAM-COLOURED VETCHLING (PEAVINE) *(Lathyrus ochroleucus)*	3	0-4	100
WILD LILY-OF-THE-VALLEY *(Maianthemum canadense)*	3	0-5	50
RUNNING RASPBERRY OR DEWBERRY *(Rubus pubescens)*	2	0-4	50
GRASSES			
HAIRY WILD RYE *(Elymus innovatus)*	7	0-13	100
PURPLE OAT GRASS *(Schizachne purpurascens)*	5	0-10	50
KENTUCKY BLUEGRASS *(Poa pratensis)*	3	0-5	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC
NUTRIENT REGIME:
MESOTROPHIC TO PERMESOTROPHIC
SOIL DRAINAGE:
WELL
ELEVATION (MEAN):
910-950 (930)M
SLOPE: 7-9%

FORAGE PRODUCTION (KG/HA) n=2

GRASS	144 (128-160)
FORBS	216 (164-268)
SHRUBS	531 (518-544)
TOTAL	891 (842-940)

SUGGESTED GRAZING
2.0 HA/AUM

h12: Aspen- White Spruce- Balsam Poplar/ Bracted Honeysuckle

(Populus tremuloides- Picea glauca- Populus balsamifera/ Lonicera involucrata)

n=2 This community type is similar to Aw-Sw-Pl/bracted honeysuckle/fern type described by Beckingham et al (1996). It is adapted from a higher moisture-nutrient relative to the modal type for the Lower Foothills, as indicated by the predominance of Pb, Bw, and bracted honeysuckle. With succession this community may revert to a Sw/bracted honeysuckle/fern and eventually to a Sw/moss or Sw/horsetail/moss type. This community type is quite productive, however grazing suitability it is species density-dependent and is less suitable in towards successional climax.

Presently this community type will provide secondary range for domestic livestock but the forage production will be reduced and the stand will become less useful for domestic livestock grazing.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
ASPEN			
(Populus tremuloides)	25	5-40	100
WHITE SPRUCE			
(Picea glauca)	25	7-25	100
BALSAM POPLAR			
(Populus balsamifera)	14	6-20	100
WHITE OR PAPER BIRCH			
(Betula papyrifera)	15	0-30	50
SHRUBS			
BRACTED HONEYSUCKLE			
(Lonicera involucrata)	4	3-4	100
SNOWBERRY			
(Symphoricarpos occidentalis)	5	1-8	100
ROSE			
(Rosa acicularis)	2	1-3	100
FORBS			
BISHOP'S-CAP			
(Mitella nuda)	5	4-5	100
BUNCHBERRY			
(Cornus canadensis)	4	2-5	100
TALL LUNGWORT OR BLUEBELLS			
(Mertensia paniculata)	3	2-4	100
PALMATE-LEAVED COLTSFOOT			
(Petasites palmatus)	3	1-5	100
DEWBERRY OR RUNNING RASPBERRY			
(Rubus pubescens)	3	2-4	100
LINDLEY'S ASTER			
(Aster ciliolatus)	2	1-3	100
WILD SARSAPARILLA			
(Aralia nudicaulis)	2	1-2	100
GRASSES			
MARSH REED GRASS			
(Calamagrostis canadensis)	2	1-3	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBHYGRIC
NUTRIENT REGIME:
MESOTROPHIC TO PERMESOTROPHIC
SOIL DRAINAGE:
MODERATELY WELL TO IMPERFECTLY
ELEVATION:
N/A
SLOPE: 1-3 %

FORAGE PRODUCTION (KG/HA)

TOTAL 900*
*ESTIMATED

SUGGESTED GRAZING
1.5 HA/AUM

GRAZED MODIFIED

MIXEDWOOD FOREST COMMUNITY TYPES

OF THE

LOWER FOOTHILLS SUBREGION

photo 14: A grazed modified, Aspen - White Spruce/ Clover mixedwood community type within the Lower Foothills subregion. With heavy grazing pressure the forage production has declined. As this stand succeeds toward climax and spruce becomes dominant, the canopy becomes closed and understory production further declines.

i1: Aspen - White Spruce/ Clover

(Populus tremuloides - Picea glauca/ Trifolium spp.)

n=10 This community type represents a heavily grazed Aspen - White Spruce/ Rose/ Forb. With heavy grazing, clover and dandelion have increased while the abundance of native vegetation has decreased. This community type, as a result from over-grazing, has become less productive relative to the ungrazing Aw-Sw/Rose/Forb community type.

This mixedwood community type seems to be fairly productive and will provide good grazing opportunities for domestic livestock providing over-grazing does not occur. As this community type matures, white spruce will increase in abundance and shade the understory forage resulting in decreased forage productivity. This community type will eventually become a non-use area.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	35	15-60	100
WHITE SPRUCE *(Picea glauca)*	18	0-60	90
LODGEPOLE PINE *(Pinus contorta)*	12	0-35	80
BLACK SPRUCE *(Picea mariana)*	2	0-15	20
SHRUBS			
ROSE *(Rosa acicularis)*	5	0-13	100
BLUEBERRY OR WHORTLEBERRY *(Vaccinium myrtilloides)*	3	0-12	50
WILLOW *(Salix spp.)*	3	0-19	50
FORBS			
CLOVER *(Trifolium spp.)*	23	0-60	100
LINDLEY'S ASTER *(Aster ciliolatus)*	4	1-9	100
STRAWBERRY *(Fragaria virginiana)*	5	0-14	90
CREAM-COLOURED VETCHLING (PEAVINE) *(Lathyrus ochroleucus)*	3	0-12	90
NORTHERN BEDSTRAW *(Galium boreale)*	1	0-2	90
TWIN-FLOWER *(Linnaea borealis)*	7	0-27	80
DANDELION *(Taraxacum officinale)*	2	0-6	80
BUNCHBERRY *(Cornus canadensis)*	3	0-9	70
COMMON PINK WINTERGREEN *(Pyrola asarifolia)*	2	0-10	70
GRASSES			
PURPLE OAT GRASS *(Schizachne purpurascens)*	3	0-11	90
KENTUCKY BLUEGRASS *(Poa pratensis)*	6	0-19	80
HAIRY WILD RYE *(Elymus innovatus)*	4	0-17	80
MARSH REED GRASS *(Calamagrostis canadensis)*	2	0-9	70
WHITE-GRAINED MOUNTAIN RICE GRASS *(Oryzopsis asperifolia)*	5	0-21	60

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBMESIC TO SUBHYGRIC
NUTRIENT REGIME:
MESOTROPHIC
SOIL DRAINAGE:
WELL TO MODERATELY WELL
ELEVATION (MEAN):
960 -1572 (1186)M
SLOPE: 0 - 3%

FORAGE PRODUCTION (KG/HA)

GRASS	161 (4-318)
FORBS	220 (182-258)
SHRUBS	115 (84-146)
TOTAL	496 (332-660)

SUGGESTED GRAZING
3.7 HA/AUM

LOWER FOOTHILLS SUBREGION

CONIFEROUS FOREST COMMUNITIES

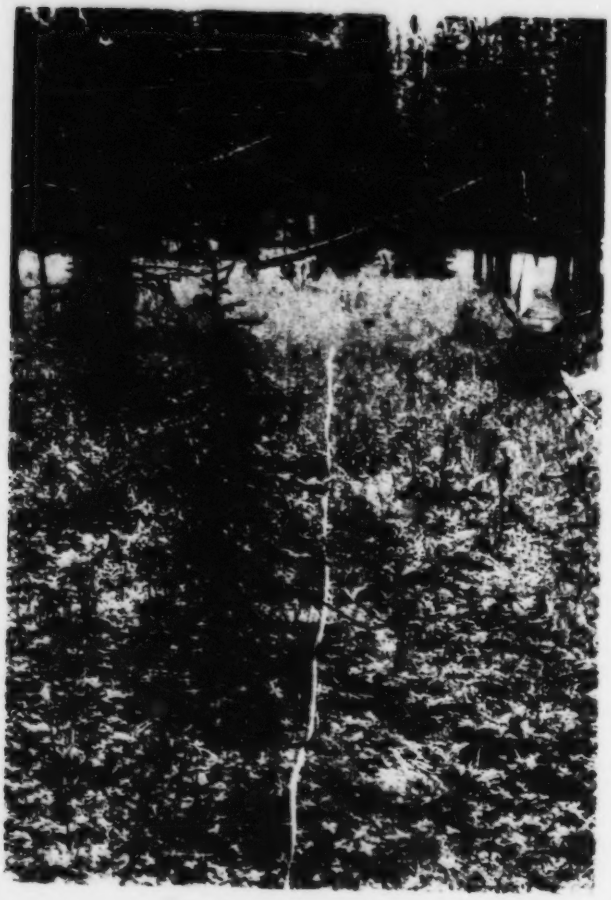


Photo 15: An open pine-dominated community type within the Lower Foothills subregion. As this stand succeeds to maturity, the spruce in the secondary canopy will become dominant.

CONIFEROUS FORESTS

Throughout the Lower Foothills subregion coniferous forest occurs either on lowland sites that have a high water table or on well drained, upland sites. The coniferous forests described here span 8 ecosites as described by Beckingham et al (1996) from submesic/medium to subhydric/rich. On sites with submesic moisture and medium nutrient regimes, the dry conditions are a result of either coarse-textured, rapidly-drained soils, or southerly aspects. Species indicating dry sites such as bearberry, bog cranberry and lichens are common (Pl/Bog cranberry/ Hairy wild rye; Pl/Bearberry/Hairy wild rye). Shrub layers are generally poorly developed and succession to spruce is very slow due to the dry site conditions.

On the mesic/poor to mesic/medium sites, the understory shrub and forb layers become slightly more developed and white spruce becomes more prevalent in the overstory (Pl/fireweed; Pl/green alder). Labrador tea and bog cranberry (j4 Pl-Sb/labrador tea/feathermoss to j7 Pl/labrador tea-bearberry) are indicative of relatively acidic surface soil conditions and thereby are lower in available soil nutrients (Beckingham 1996). These community types are generally unsuitable for domestic livestock grazing.

The modal ecosite for the Lower Foothills subregion is the mesic/medium low-bush cranberry ecosite. Aspen and lodgepole pine stands are prevalent in the area due to high fire frequency. Young stands of aspen and lodgepole pine generally have a higher grass and shrub layer and thus can provide some forage for domestic livestock (Pl/kentucky bluegrass/clover; Pl/green alder; Sw/kentucky bluegrass/clover). After canopy closure, shrub species become more prevalent than grass and forbs (Pl-Sw/Twinflower/Moss; Sw/Buffaloberry). In older stands, moss becomes more dominant as light levels decrease and forbs and shrubs are shaded out (Sw/Moss).

As moisture and nutrients increase, such as on seepage areas, the understory becomes especially well-developed (Sw/Alder; Sw/willow-bracted honeysuckle; Se-Pl/Cow parsnip). Often a dense shrub understory will inhibit access for cattle (thus making some of these areas non-use despite an abundance of forage) as well as inhibit regrowth of spruce seedlings after disturbance such as fire and logging (Archibald et al 1996). Engelmann spruce is generlly not found in the Lower Foothills subregion, thus its presence here may indicate a transition to the higher elevation Upper Foothills subregion.

Black spruce and larch communities dominate on wetter, lowland sites with subhygric to subhydric moisture regimes and poor to rich nutrient regimes. Generally, larch is more tolerant of excessive moisture and is indicative of an enriched nutrient status, while black spruce is typical in areas of stagnating ground water with poor nutrient status (Hay et al 1985). These community types are considered non-use for domestic livestock.

Figures 15 and 16 illustrate how these conifer community types are arranged in the landscape.

Table 11. Forage production summary for coniferous community types of the Lower Foothills subregion

Ecosite	Community number	Community type	Productivity (kg/ha)				sample size (n)	Suggested Grazing (ha/AUM)
			Grass	Forb	Shrub	Total		
c hairy wild rye submesic/ medium	**Ecosite phase**	**c1 hairy wild rye Pl**	**220**	**196**	**104**	**495**	**12**	**3.7**
	j1	Pl/bearberry/hairy wild rye	291	124	109	524	3	3.5
	j2	Pl/bog cranberry/hairy wild rye	196	220	102	485	9	3.8
	Ecosite phase	**c1_harvest Pl**	**293**	**309**	**284**	**886**	**2**	**3.7**
	l1	WGMG/bearberry/Pl-Aw	293	309	284	886	2	3.7
	Ecosite phase	**c4 hairy wild rye Sw**	**146**	**198**	**124**	**468**	**5**	**3.9**
	j3	Sw/buffalo-berry-bearberry	146	198	124	468	5	3.9
	Ecosite phase	**c4_harvest Sw**	**432**	**765**	**222**	**1419**	**2**	**3.9**
	l3	buffalo-berry/bearberry/Sw	432	765	222	1419	2	3.9
d labrador tea - mesic mesic/poor	**Ecosite phase**	**d1 labrador tea - mesic - Pl-Sw**	**n/a**	**n/a**	**n/a**	**n/a**	**0**	**non-use**
	j4	Pl-Sb/labrador tea/feathermoss	n/a	n/a	n/a	n/a	0	non-use
	j5	Pl-Sb/feathermoss	n/a	n/a	n/a	n/a	0	non-use
	Ecosite phase	**d2 labrador tea - mesic Pl**	**154**	**292**	**437**	**888**	**7**	**2.1**
	j6	Pl/labrador tea-bog cranberry	121	235	439	800	5	2.2

Ecosite	Community number	Community type	Productivity (kg/ha)				sample size (n)	Suggested Grazing (ha/AUM)
			Grass	Forb	Shrub	Total		
	j7	Pl/labrador tea-bearberry	239	435	432	1106	2	1.6
e low-bush cranberry mesic/ medium	**Ecosite phase**	**e1 low-bush cranberry-Pl**	**200**	**350**	**60**	**610**	**1**	**3.0**
	j8	Pl/alder	n/a	n/a	n/a	n/a	0	n/a
	j9	Pl/fireweed	200	350	60	610	1	3.0
	Ecosite phase	**e1_ grazed Pl**	**336**	**672**	**336**	**1344**	**1**	**3.0**
	k1	Pl/kentucky bluegrass/clover	336	672	336	1344	1	3.0
	Ecosite phase	**e1_harvest Pl**	**578**	**419**	**88**	**1084**	**9**	**3.0**
	l4	Pl/hairy wild rye/rose	578	419	88	1084	9	3.0
	Ecosite phase	**e1_harvest_grazed Pl**	**885**	**821**	**503**	**2210**	**3**	**3.0**
	m1	Aw-Pl/alder/clover/kentucky bluegrass	885	821	503	2210	3	3.0
	Ecosite phase	**e3 low-bush cranberry Aw-Sw-Pl**	**195**	**345**	**210**	**750**	**69**	**2.4**
	j10	Pl-Sw/twinflower/moss	103	282	154	539	5	3.4
	Ecosite phase	**e4 low-bush cranberry Sw**	**98**	**287**	**104**	**489**	**13**	**3.7**
	j11	Sw/buffalo-berry	18	46	95	160	1	non-use
	j12	Sw/moss	105	307	105	516	12	3.5

Ecosite	Community number	Community type	Productivity (kg/ha)				sample size (n)	Suggested Grazing (ha/AUM)
			Grass	Forb	Shrub	Total		
	Ecosite phase	**e4_grazed Sw**	**48**	**598**	**132**	**778**	**1**	**3.7**
	k2	Sw/kentucky bluegrass/clover	48	598	132	778	1	3.7
	Ecosite phase	**e4_harvest Sw**	**1184**	**455**	**116**	**1755**	**4**	**3.7**
	l9	moss/marsh reedgrass	1184	455	116	1755	4	3.7
f bracted honeysuckle subhygric/ rich	**Ecosite phase**	**f3 bracted honeysuckle Aw-Sw-Pl**	**1490**	**352**	**175**	**2014**	**1**	**0.9**
	j13	Se-Pl/cow parsnip	1490	352	175	2014	1	0.9
	Ecosite phase	**f4 bracted honeysuckle Sw**	**51**	**394**	**147**	**592**	**3**	**3.1**
	j14	Sw/willow-bracted honeysuckle	63	425	159	646	2	2.8
	j15	Sw/alder	28	332	124	484	1	3.8
	Ecosite phase	**f4_harvest Sw**	**761**	**846**	**1**	**1608**	**1**	**3.1**
	l15	Sw/willow/marsh reedgrass	761	846	1	1608	1	3.1
h labrador tea - subhygric subhygric/ poor	**Ecosite phase**	**h1 labrador tea-subhygric-Sb-Pl**	**n/a**	**n/a**	**n/a**	**n/a**	**0**	**non-use**
	j16	Sb-Pl/moss	n/a	n/a	n/a	n/a	0	non-use
	Ecosite phase	**h1_harvest Sb-Pl**	**n/a**	**n/a**	**n/a**	**n/a**	**0**	**non-use**
	l16	Pl-Sb/labrador tea/horsetail/moss	n/a	n/a	n/a	n/a	0	non-use

Ecosite	Community number	Community type	Productivity (kg/ha)				sample size (n)	Suggested Grazing (ha/AUM)
			Grass	Forb	Shrub	Total		
I horsetail hygric/rich	**Ecosite phase**	**i3 horsetail Sw**	**n/a**	**n/a**	**n/a**	**n/a**	**0**	**non-use**
	j17	Sw/horsetail/moss	n/a	n/a	n/a	n/a	0	non-use
j labrador tea/ horsetail hygric /medium	**Ecosite phase**	**j1 Sb-Sw/labrador tea/horsetail**	**n/a**	**n/a**	**n/a**	**n/a**	**0**	**non-use**
	j18	Sb/labrador tea/horsetail/moss	n/a	n/a	n/a	n/a	0	non-use
	Ecosite phase	**j1_harvest Sb-Sw**	**n/a**	**n/a**	**n/a**	**n/a**	**0**	**non-use**
	l17	willow/hair-like sedge/Sw	n/a	n/a	n/a	n/a	0	non-use
k bog subhydric/ poor	**Ecosite phase**	**k1 treed bog**	**23**	**335**	**786**	**1144**	**2**	**non-use**
	j19	Sb/labrador tea-bog cranberry/cloudberry	23	335	786	1144	2	non-use
l poor fen subhydric/ medium	**Ecosite phase**	**l1 treed poor fen**	**377**	**242**	**137**	**757**	**9**	**non-use**
	j20	Sb-Lt/sedge/moss	377	242	137	757	9	non-use
m rich fen subhydric/ rich	**Ecosite phase**	**m1 treed rich fen**	**n/a**	**n/a**	**n/a**	**n/a**	**0**	**non-use**
	j21	Lt/bog birch/sedge moss	n/a	n/a	n/a	n/a	0	non-use

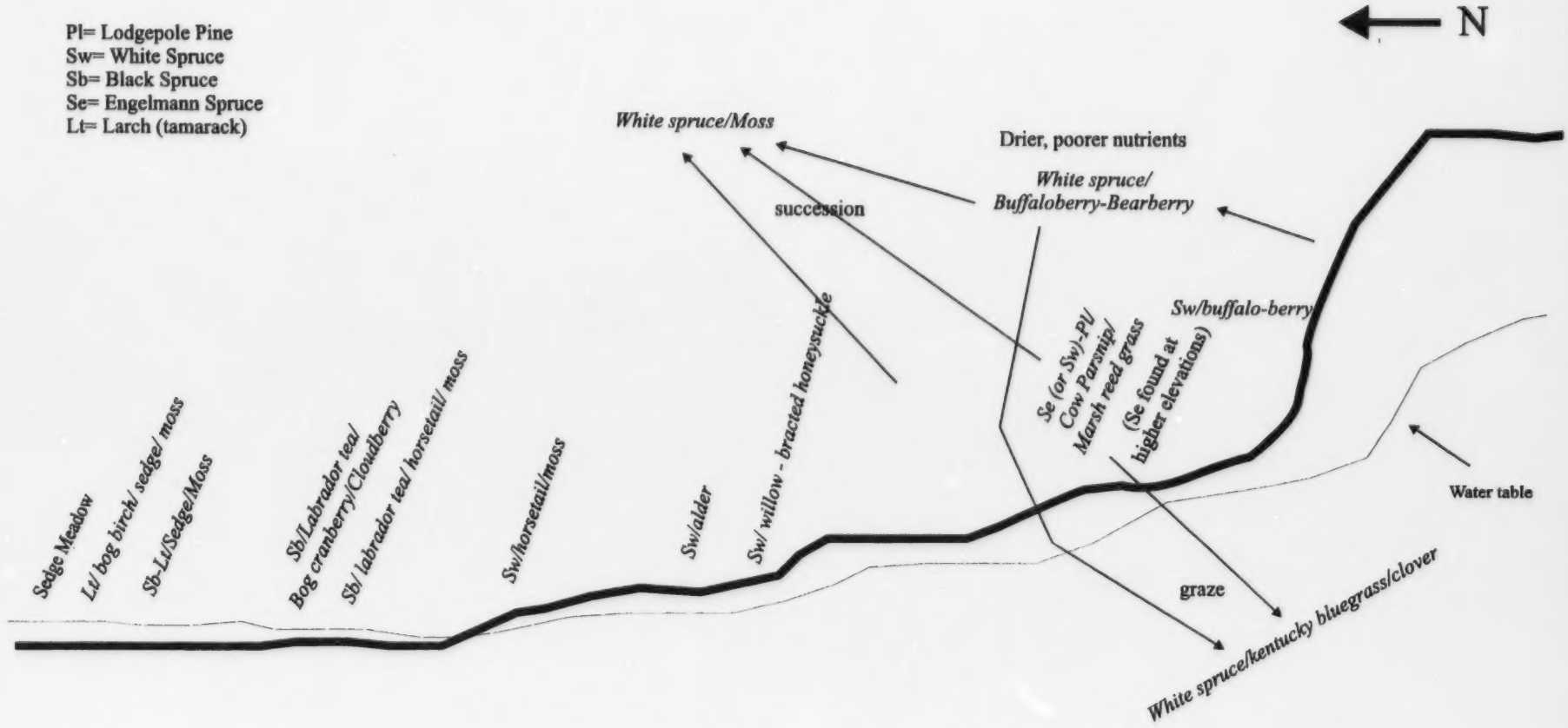


Figure 15. Landscape profile of conifer (Sb, Sw) community types of the Lower Foothills Subregion.

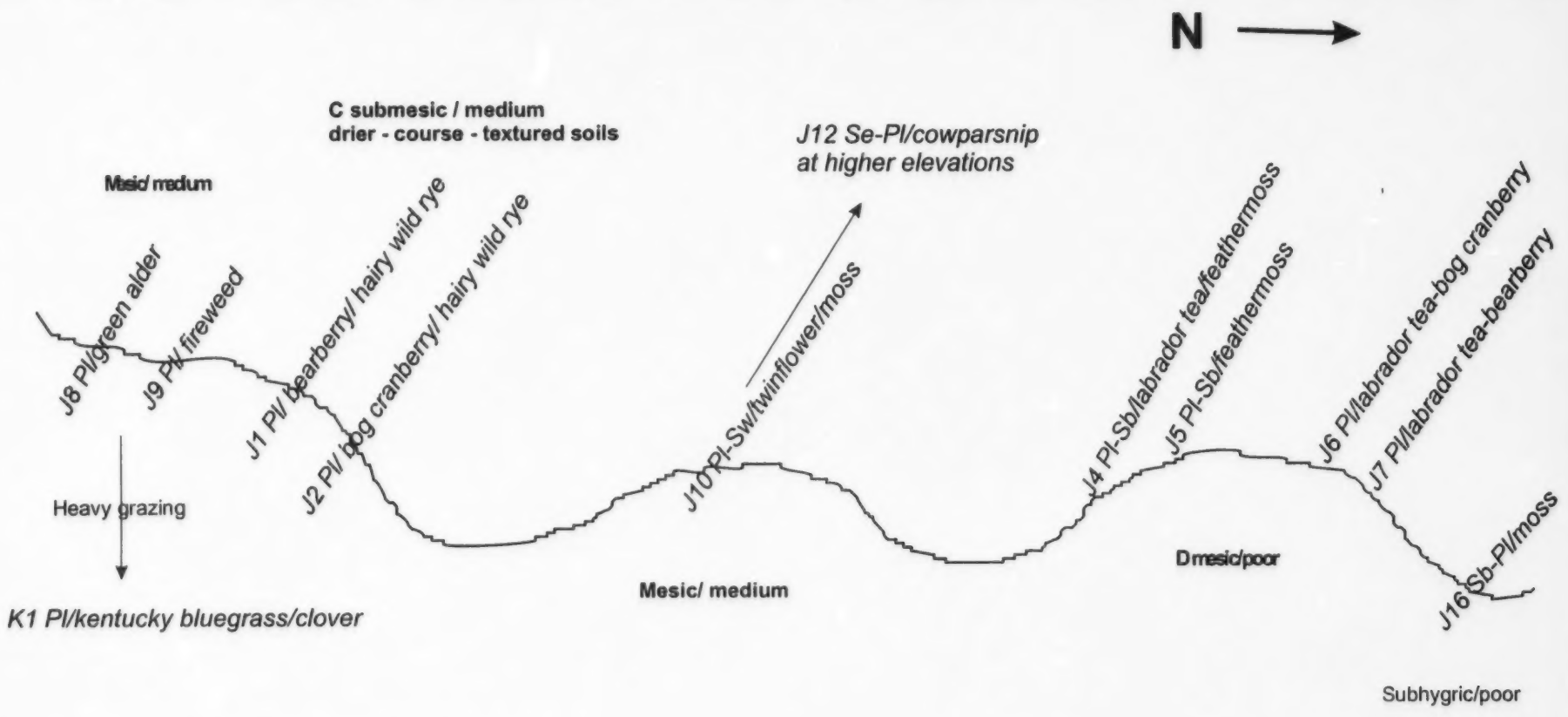


Figure 16. Landscape profile of pine dominated conifer community types of the Lower Foothills Subregion.

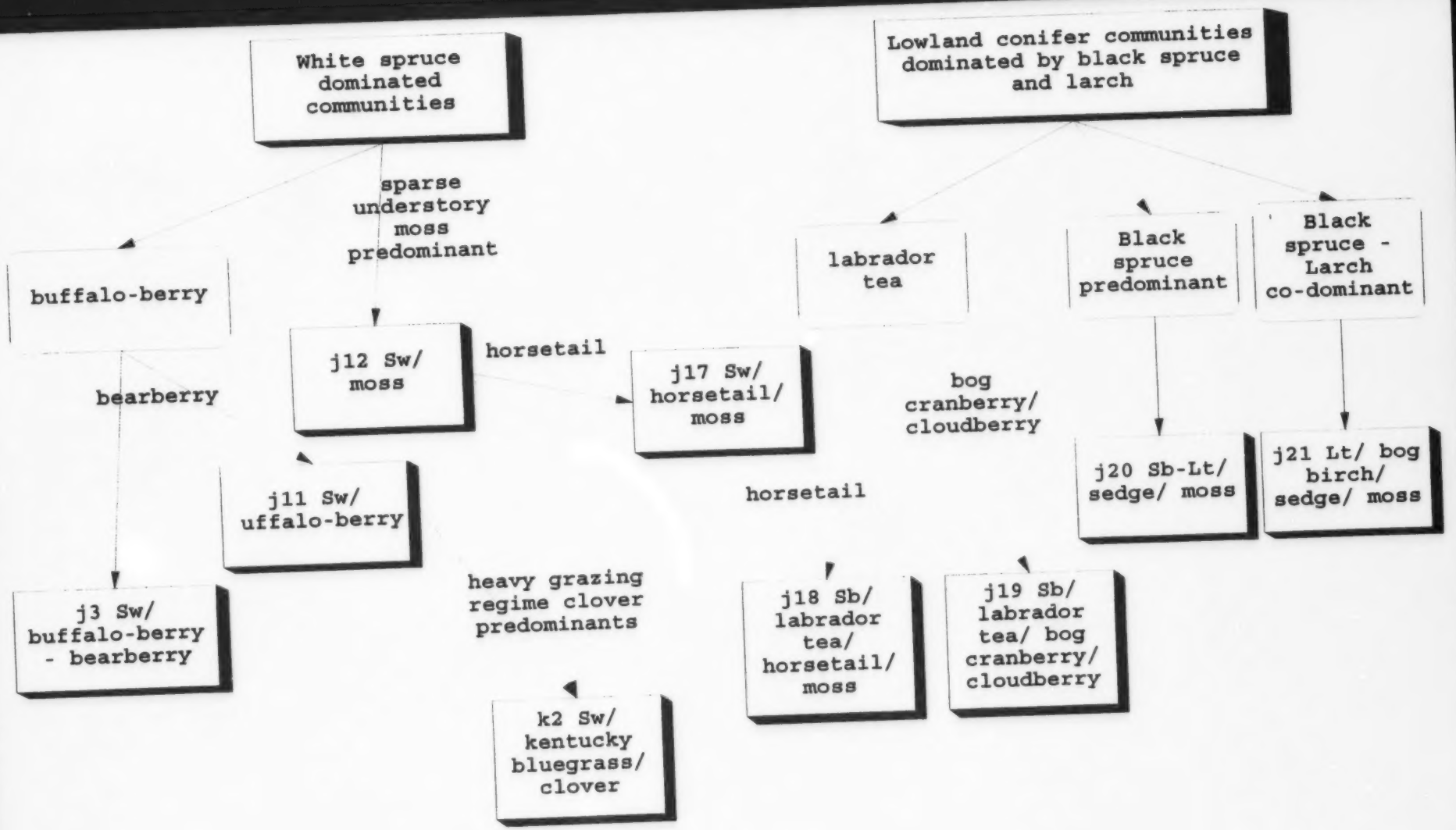


Figure 17. Key to coniferous (Sw,Sb, and Lt) community types of the Lower Foothills Subregion.

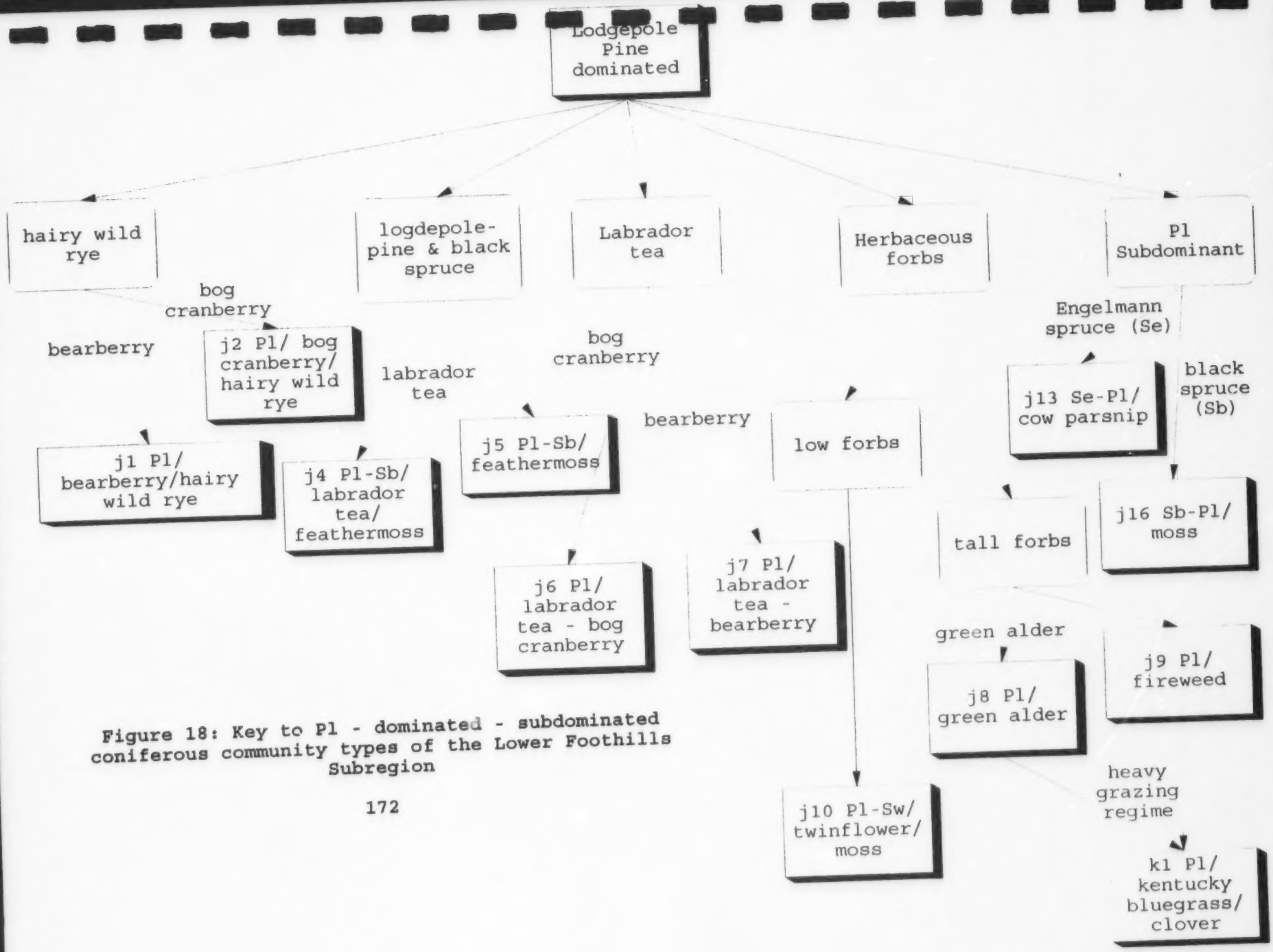


Figure 18: Key to Pl - dominated - subdominated coniferous community types of the Lower Foothills Subregion

j1: Lodgepole Pine/ Bearberry/Hairy Wild Rye

(Pinus contorta/ Arctostaphylos uva-ursi/ Elymus innovatus)

n=7 This community type occurs on coarse, well drained soils with poor nutrient regimes. These sites also tend to be dry as indicated by the predominance of hairy wild rye and bearberry. This community type occurs on a wide variety of site locations as long as the soil parent material is coarse, low in nutrients, and receives no underground seepage water. It is similar tothe Pl/buffalo-berry/hairy wild rye type described by Beckingham et. al. 1996.

This community type is usually considered to be non-use range. But, if it is located near a physical feature that attracts cattle into the area (ie. salt licks, grassland clearings, water, etc.) it can be considered as secondary range.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
LODGEPOLE PINE *(Pinus contorta)*	46	30-60	100
ASPEN *(Populus tremuloides)*	3	0-11	43
WHITE SPRUCE *(Picea glauca)*	4	0-15	29
SHRUBS			
BEARBERRY *(Arctostaphylos uva-ursi)*	27	9-52	100
ROSE *(Rosa acicularis)*	7	1-19	100
BOG CRANBERRY *(Vaccinium vitis-idaea)*	6	0-12	71
BUFFALOBERRY *(Shepherdia canadensis)*	6	0-20	71
BLUEBERRY OR WHORTLEBERRY *(Vaccinium myrtilloides)*	7	0-34	57
WILLOW *(Salix spp.)*	3	0-15	57
DWARF BILBERRY *(Vaccinium caespitosum)*	5	0-21	43
FORBS			
STRAWBERRY *(Fragaria virginiana)*	7	0-12	100
TWIN-FLOWER *(Linnaea borealis)*	16	0-27	86
LINDLEY'S ASTER *(Aster ciliolatus)*	3	0-13	86
CREAM-COLOURED VETCHLING (PEAVINE) *(Lathyrus ochroleucus)*	4	0-12	71
WILD LILY-OF-THE-VALLEY *(Maianthemum canadense)*	2	0-4	71
BUNCHBERRY *(Cornus canadensis)*	3	0-9	57
GRASSES			
HAIRY WILD RYE *(Elymus innovatus)*	10	0-16	100
UPLAND SEDGES *(Carex spp.)*	1	0-3	57
PURPLE OAT GRASS *(Schizachne purpurascens)*	3	0-14	43
Mosses			
MOSS *(Moss spp.)*	38	0-80	86

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBMESIC TO MESIC
NUTRIENT REGIME:
MESOTROPHIC
SOIL DRAINAGE:
WELL
ELEVATION (MEAN):
841 - 1140 (961)M
SLOPE: 0 - 3%

FORAGE PRODUCTION (KG/HA) N=3

GRASS	291 (48-640)
FORBS	124 (77-200)
SHRUBS	109 (0-194)
TOTAL	524 (278-840)

SUGGESTED GRAZING
3.5 HA/AUM

j2: Lodgepole Pine/ Bog Cranberry/ Hairy Wild Rye

(Pinus contorta/ Vaccinium vitis-idaea/ Elymus innovatus)

n=11 This community type occurs on fairly coarse, well drained parent material, which makes the site fairly dry with a poor nutrient regime.

This community type corresponds to Beckingham's (1993) Pl - Aw/ Hylo spl - Pleu sch association. According to Beckingham (1993), this community type is thought to represent a transition from the aspen to the lodgepole pine dominated types in the Lower Foothills subregion. He also felt that the presence of white spruce in the canopy suggests succession to his Sw/ Feathermoss or Sw - Fb/ Feathermoss associations.

Generally, this community type is not useful for livestock grazing because it does not produce good quality forage. However, it may provide some cover value.

PLANT COMPOSITION — CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
LODGEPOLE PINE *(Pinus contorta)*	52	20-65	100
WHITE SPRUCE *(Picea glauca)*	6	0-20	55
SHRUBS			
BOG CRANBERRY *(Vaccinium vitis-idaea)*	18	0-36	91
ROSE *(Rosa acicularis)*	6	1-18	100
BUFFALO-BERRY *(Shepherdia canadensis)*	5	0-21	73
DWARF BILBERRY *(Vaccinium caespitosum)*	5	0-19	73
FORBS			
BUNCHBERRY *(Cornus canadensis)*	11	1-23	100
TWINFLOWER *(Linnaea borealis)*	6	1-11	100
WILD LILY-OF-THE-VALLEY *(Maianthemum canadense)*	4	0-14	91
HEART-LEAVED ARNICA *(Arnica cordifolia)*	2	0-11	73
FIREWEED *(Epilobium angustifolium)*	2	0-5	73
COMMON PINK WINTERGREEN *(Pyrola asarifolia)*	4	0-8	73
STRAWBERRY *(Fragaria virginiana)*	4	0-12	64
LINDLEY'S ASTER *(Aster ciliolatus)*	3	0-13	64
COLTSFOOT *(Petasites palmatus)*	1	0-6	64
CREAM-COLOURED VETCHLING (PEAVINE) *(Lathyrus ochroleucus)*	3	0-11	46
GRASSES			
HAIRY WILD RYE *(Elymus innovatus)*	14	3-39	100
MARSH REED GRASS *(Calamagrostis canadensis)*	2	0-6	46
MOSSES			
Moss spp.	60	0-95	91

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBMESIC
NUTRIENT REGIME:
MESOTROPHIC
SOIL DRAINAGE:
WELL
ELEVATION (MEAN):
835 - 1570 (1216)M
SLOPE: 0 - 3%

FORAGE PRODUCTION (KG/HA) N=9

GRASS	196 (12-606)
FORBS	220 (18-584)
SHRUBS	102 (32-276)
TOTAL	485 (62-232)

SUGGESTED GRAZING
3.8 HA/AUM

j3: White Spruce/ Buffaloberry - Bearberry

(Picea glauca/ Shepherdia canadensis - Arctostaphylos uva-ursi)

n=6 This community type was recorded around Hinton, close to the borders of the Montane and Upper Foothills subregions. It is a fairly dry type, with a poor nutrient regime; as indicated by the high abundance of buffalo-berry and bearberry. It may also be somewhat windswept and dessicated; as indicated by the low tree canopy cover.

If this community type is located near a physical feature that attracts livestock to the area it may be considered to be primary or secondary range. In other instances though, where it is not near an attractive feature, this community type would be considered as non-use range.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
WHITE SPRUCE *(Picea glauca)*	41	25-60	100
ASPEN *(Populus tremuloides)*	4	0-15	83
SHRUBS			
BEARBERRY *(Arctostaphylos uva-ursi)*	26	3-79	100
BUFFALOBERRY *(Shepherdia canadensis)*	18	5-29	100
ROSE *(Rosa acicularis)*	8	0-23	100
WILLOW *(Salix spp.)*	4	0-17	83
FORBS			
STRAWBERRY *(Fragaria virginiana)*	6	0-14	100
LINDLEY'S ASTER *(Aster ciliolatus)*	4	2-5	100
ALPINE MILK VETCH *(Astragalus alpinus)*	3	0-4	100
SHOWY LOCOWEED *(Oxytropis splendens)*	4	0-8	83
AMERICAN HEDYSARUM *(Hedysarum alpinum)*	3	0-8	83
SHOWY ASTER *(Aster conspicuus)*	6	0-24	67
LOW GOLDENROD *(Solidago missouriensis)*	2	0-5	67
GRASSES			
UPLAND SEDGES *(Carex spp.)*	11	4-20	100
HAIRY WILD RYE *(Elymus innovatus)*	1	0-2	83
SMOOTH BROME *(Bromus Inermis)*	4	0-20	33
MOSSES			
Moss spp.	42	16-79	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC
NUTRIENT REGIME:
MESOTROPHIC
SOIL DRAINAGE:
WELL
ELEVATION (MEAN):
914 - 1100 (976)M
SLOPE: 0 - 10%

FORAGE PRODUCTION (KG/HA) N=5

GRASS 146 (10-356)
FORBS 198 (70-344)
SHRUBS 124 (58-310)
TOTAL 468 (158-876)

SUGGESTED GRAZING
3.9 HA/AUM

j4: Lodgepole Pine - Black Spruce/ Labrador Tea/ Feathermoss

(Pinus contorta - Picea mariana/ Ledum groenlandicum - Pleurozium schreberi)

n=6 This community type has also been described by Corns and Annas (1986) and Beckingham et.al. (1996). It has a fire origin and can persist for over 100 years (Corns and Annas 1986). Soils in this community type tend to be acidic as indicated by the abundance of labrador tea and bog cranberry.

This community type produces little palatable of forage for domestic livestock and therefore is considered to be a non-use area for grazing. This community type may provide good cover for protection from sun, wind, rain, etc., which can be important for grazing animals.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
LODGEPOLE PINE *(Pinus contorta)*	53	25-85	100
BLACK SPRUCE *(Picea mariana)*	35	1-30	100
ASPEN *(Populus tremuloides)*	3	0-10	33
SHRUBS			
LABRADOR TEA *(Ledum groenlandicum)*	22	2-80	100
BLUEBERRY OR WHORTLEBERRY *(Vaccinium myrtilloides)*	2	1-5	100
BOG CRANBERRY *(Vaccinium vitis-idaea)*	1	0-3	83
FORBS			
TWINFLOWER *(Linnaea borealis)*	2	1-3	100
BUNCHBERRY *(Cornus canadensis)*	4	0-10	83
COLTSFOOT *(Petasites palmatus)*	1	0-2	83
FIREWEED *(Epilobium angustifolium)*	1	0-2	67
GRASSES			
HAIRY WILD RYE *(Elymus innovatus)*	1	0-1	67
MOSSES			
Moss spp.	74	0-95	83

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC
NUTRIENT REGIME:
MESOTROPHIC
SOIL DRAINAGE:
WELL
SLOPE: 0 - 5 %

FORAGE PRODUCTION (KG/HA)

N/A

NON-USE

j5: Lodgepole Pine- Black Spruce/ Feathermoss

(Pinus contorta- Picea mariana/ Moss spp.)

n=1

This community type is also described by Beckingham et. al. 1996. It produces little palatable of forage for domestic livestock and therefore is considered to be a non-use area for grazing. This community type may provide good cover for protection from sun, wind, rain, etc., which can be important for grazing animals.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
LODGEPOLE PINE *(Pinus contorta)*	40	-	100
BLACK SPRUCE *(Picea mariana)*	60	-	100
ASPEN *(Populus tremuloides)*	3	-	100
PAPER BIRCH *(Betula papyrifera)*	3	-	100
SHRUBS			
BRACTED HONEYSUCKLE *(Lonicera involucrata)*	1	-	100
ROSE *(Rosa acicularis)*	1	-	100
LOW BUSH CRANBERRY *(Viburnum edule)*	1	-	100
FORBS			
BUNCHBERRY *(Cornus canadensis)*	1	-	100
TWINFLOWER *(Linnaea borealis)*	1	-	100
BISHOP'S-CAP *(Mitella nuda)*	1	-	100
MOSSES			
Moss spp.	60	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBHYGRIC
NUTRIENT REGIME:
SUBMESOTROPHIC
SOIL DRAINAGE:
IMPERFECTLY
SLOPE: 5 %

FORAGE PRODUCTION (KG/HA)

N/A

NON-USE

j6: Lodgepole Pine/ Labrador Tea- Bog Cranberry

(Pinus contorta/ Ledum groenlandicum -Vaccinium vitis-idaea)

n=17 This community type is similar to the Pl-Sb/Ledu gro - Vacc vit/ Pleu sch association of Beckingham (1993). Soils in this community type tend to be acidic as indicated by the abundance of labrador tea and bog cranberry.

This community type produces little palatable of forage for domestic livestock and therefore is considered to be a non-use area for grazing. This community type may provide good cover for protection from sun, wind, rain, etc., which can be important for grazing animals.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
LODGEPOLE PINE *(Pinus contorta)*	57	18-85	100
WHITE SPRUCE *(Picea glauca)*	4	0-15	41
ASPEN *(Populus tremuloides)*	1	0-5	41
SHRUBS			
LABRADOR TEA *(Ledum groenlandicum)*	27	1-66	100
BOG CRANBERRY *(Vaccinium vitis-idaea)*	18	0-35	94
BLUEBERRY OR WHORTLEBERRY *(Vaccinium myrtilloides)*	8	0-20	77
ROSE *(Rosa acicularis)*	4	0-10	82
BUFFALO-BERRY *(Shepherdia canadensis)*	3	0-15	59
WILLOW *(Salix spp.)*	1	0-4	47
FORBS			
BUNCHBERRY *(Cornus canadensis)*	10	0-28	94
TWINFLOWER *(Linnaea borealis)*	8	0-25	94
WILD LILY-OF-THE-VALLEY *(Maianthemum canadense)*	4	0-15	65
CREAM-COLOURED VETCHLING (PEAVINE) *(Lathyrus ochroleucus)*	3	0-12	77
FIREWEED *(Epilobium angustifolium)*	3	0-12	77
STRAWBERRY *(Fragaria virginiana)*	1	0-6	41
GRASSES			
HAIRY WILD RYE *(Elymus innovatus)*	4	0-17	88
MARSH REED GRASS *(Calamagrostis canadensis)*	4	0-31	65
PURPLE OAT GRASS *(Schizachne purpurascens)*	1	0-12	12
MOSSES			
Moss spp.	49	0-99	77

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC
NUTRIENT REGIME:
MESOTROPHIC
SOIL DRAINAGE:
WELL TO MODERATELY WELL
ELEVATION (MEAN):
860 - 1540 (1061)M
SLOPE (MEAN):
0 - 9 (3) %

FORAGE PRODUCTION (KG/HA) n=5

GRASS	121 (32-331)
FORBS	235 (34-457)
SHRUBS	439 (171-770)
TOTAL	800 (568-959)

SUGGESTED GRAZING
2.2 HA/AUM

j7: Lodgepole Pine/ Labrador Tea - Bearberry

(Pinus contorta/ Ledum groenlandicum - Arctostaphylos uva-ursi)

n=4 This community type often occurs on higher land near bogs. Its soils are usually coarse, low in nutrients, and acidic. White spruce is a major part of the overstory and it is expected to become dominant as this community type succeeds towards climax.

This community type does not produce very much palatable forage in its present state and is expected to produce less as white spruce exerts more dominance over the site. Therefore, this community type is considered to be non-use range for livestock. Even though this community type produce little forage, it may provide some cover for livestock.

PLANT COMPOSITION

	CANOPY COVER(%) MEAN	RANGE	CONST.
TREES			
LODGEPOLE PINE *(Pinus contorta)*	53	25-80	100
WHITE SPRUCE *(Picea glauca)*	4	0-40	75
SHRUBS			
LABRADOR TEA *(Ledum groenlandicum)*	28	7-41	100
BEARBERRY *(Arctostaphylos uva-ursi)*	27	0-39	100
BLUEBERRY OR WHORTLEBERRY *(Vaccinium myrtilloides)*	6	4-7	100
ROSE *(Rosa acicularis)*	7	0-20	100
BUFFALOBERRY *(Shepherdia canadensis)*	5	0-12	75
FORBS			
TWINFLOWER *(Linnaea borealis)*	10	4-15	100
BUNCHBERRY *(Cornus canadensis)*	15	1-40	100
WILD LILY-OF-THE-VALLEY *(Maianthemum canadense)*	3	2-4	100
CREAM-COLOURED VETCHLING (PEAVINE) *(Lathyrus ochroleucus)*	7	0-20	100
STRAWBERRY *(Fragaria virginiana)*	2	0-3	100
NORTHERN BEDSTRAW *(Galium boreale)*	1	0-2	75
GRASSES			
HAIRY WILD RYE *(Elymus innovatus)*	8	0-26	75
WHITE-GRAINED MOUNTAIN RICE GRASS *(Oryzopsis asperifolia)*	5	0-19	50
PURPLE OAT GRASS *(Schizachne purpurascens)*	6	0-13	50
MOSSES			
Moss spp.	61	40-83	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC
NUTRIENT REGIME:
MESOTROPHIC
SOIL DRAINAGE:
MODERATELY WELL
ELEVATION (MEAN):
797-975 (923)M
SLOPE : 3-5%

FORAGE PRODUCTION (KG/HA) N=2

GRASS	239 (228-250)
FORBS	435 (400-470)
SHRUBS	432 (432-432)
TOTAL	1106(1082-1130)

SUGGESTED GRAZING
1.6 HA/AUM

j8: Lodgepole Pine/ Green Alder

(Pinus contorta/ Alnus crispa)

n=4 This community type corresponds to the Pl-Aw/Alnus cri association of Beckingham (1993). It seems to be fairly moist and nutrient rich as indicated by the rich forb layer and high cover of green alder. According to Beckingham (1993) his Sw/Alnu cri/feathermoss association is the expected climax type. This community type seems to form on slopes that have coarse soils and underground seepage. The underground seepage makes this community type fairly moist and nutrient rich. The high amount of moisture allows green alder to proliferate and the high nutrient regime allows wild sarsaparilla to proliferate.

This community type will not be very useful for livestock grazing because the dense alder cover restricts livestock access. Therefore, it is classified as non-use range.

PLANT COMPOSITION

	CANOPY COVER(%) MEAN	RANGE	CONST.
TREES			
LODGEPOLE PINE *(Pinus contorta)*	60	50-65	100
ASPEN *(Populus tremuloides)*	4	0-15	50
WHITE SPRUCE *(Picea glauca)*	3	0-10	25
SHRUBS			
GREEN ALDER *(Alnus crispa)*	16	8-34	100
ROSE *(Rosa acicularis)*	7	1-13	100
LOW BUSH CRANBERRY *(Viburnum edule)*	2	0-4	100
WHITE MEADOWSWEET *(Spiraea betulifolia)*	1	0-3	75
RASPBERRY *(Rubus idaeus)*	2	0-6	50
BLUEBERRY OR WHORTLEBERRY *(Vaccinium myrtilloides)*	1	0-5	50
BRACTED HONEYSUCKLE *(Lonicera involucrata)*	1	0-7	25
FORBS			
BUNCHBERRY *(Cornus canadensis)*	10	7-12	100
WILD SARSAPARILLA *(Aralia nudicaulis)*	10	5-15	100
FIREWEED *(Epilobium angustifolium)*	7	4-10	100
TWINFLOWER *(Linnaea borealis)*	6	0-12	75
DEWBERRY OR RUNNING RASPBERRY *(Rubus pubescens)*	5	0-14	75
WILD LILY-OF-THE-VALLEY *(Maianthemum canadense)*	2	0-3	75
HEART-LEAVED ARNICA *(Arnica cordifolia)*	1	0-1	75
GRASSES			
HAIRY WILD RYE *(Elymus innovatus)*	7	0-13	100
MOSSES			
Moss spp.	44	23-72	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC
NUTRIENT REGIME:
PERMESOTROPHIC
SOIL DRAINAGE:
MODERATELY WELL
ELEVATION:
1143 - 1350(1256)M
SLOPE: 2 - 35 %

ASPECT: NORTH

FORAGE PRODUCTION (KG/HA)

TOTAL = 600*
*ESTIMATED

SUGGESTED GRAZING
3.0 HA/AUM

j9: Lodgepole Pine/ Fireweed

(Pinus contorta/ Epilobium angustifolium)

n=2 This community type contains mature lodgepole pine trees and has a fairly open tree canopy which allows for good understory growth.

Because this community type has an open canopy and low stem density, understory forage production is fairly high. Along with good understory forage production, access through this community type is good which makes it useful for livestock grazing. It can probably be considered as secondary range as long as access is good. If this community type occurs adjacent to a physical feature that attracts livestock to the area, it may be considered as primary range.

PLANT COMPOSITION

	CANOPY COVER(%) MEAN	RANGE	CONST.
TREES			
LODGEPOLE PINE *(Pinus contorta)*	43	25-60	100
SHRUBS			
ROSE *(Rosa acicularis)*	2	0-3	100
FORBS			
FIREWEED *(Epilobium angustifolium)*	24	9-38	100
CREAM-COLOURED VETCHLING (PEAVINE) *(Lathyrus ochroleucus)*	10	8-12	100
LINDLEY'S ASTER *(Aster ciliolatus)*	6	4-8	100
STRAWBERRY *(Fragaria virginiana)*	5	3-6	100
TALL LUNGWORT OR BLUEBELLS *(Mertensia paniculata)*	4	0-7	100
DWARF RASPBERRY *(Rubus arcticus)*	3	0-4	100
RICHARDSON'S GERANIUM *(Geranium richardsonii)*	2	0-2	100
PALMATE-LEAVED COLTSFOOT *(Petasites palmatus)*	2	0-2	100
GRASSES			
HAIRY WILD RYE *(Elymus innovatus)*	10	9-10	100
MARSH REED GRASS *(Calamagrostis canadensis)*	2	0-4	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC
NUTRIENT REGIME:
MESOTROPHIC
SOIL DRAINAGE:
MODERATELY WELL
ELEVATION (MEAN):
1380 - 1410 (1395)M
SLOPE: 2 - 30 %

ASPECT: VARIABLE

FORAGE PRODUCTION (KG/HA) n=1

GRASS	200
FORBS	350
SHRUBS	60
TOTAL	610

SUGGESTED GRAZING
3.0 HA/AUM

j10: Lodgepole Pine - White Spruce/ Twinflower/Moss

(Pinus contorta - Picea glauca/ Linnaea borealis/ Moss spp.)

n=8 This community type is ecologically similar to the Pl-Aw/Hylo spl - Pleu sch association of Beckingham (1993). However, this community type is more successionally advanced and white spruce is well established in the stand. As this forest grows older, white spruce will eventually replace lodgepole pine as the dominant tree species. This community type represents an intermediate state between a young seral deciduous stand and a climax white spruce - balsam fir stand.

This community type may provide a moderate amount of forage for domestic livestock. It may be important for shelter from the sun, wind, or rain. This community type would be considered secondary range for domestic livestock.

PLANT COMPOSITION

	CANOPY COVER(%) MEAN	RANGE	CONST.
TREES			
LODGEPOLE PINE *(Pinus contorta)*	36	15-55	100
WHITE SPRUCE *(Picea glauca)*	31	1-60	100
ASPEN *(Populus tremuloides)*	8	0-15	75
BALSAM POPLAR *(Populus balsamifera)*	1	0-5	13
SHRUBS			
BUFFALOBERRY *(Shepherdia canadensis)*	7	0-20	88
ROSE *(Rosa acicularis)*	3	0-6	88
BOG CRANBERRY *(Vaccinium vitis-idaea)*	5	0-19	63
LABRADOR TEA *(Ledum groenlandicum)*	5	0-17	63
BLUEBERRY OR WHORTLEBERRY *(Vaccinium myrtilloides)*	2	0-6	50
FORBS			
TWINFLOWER *(Linnaea borealis)*	10	2-25	100
STRAWBERRY *(Fragaria virginiana)*	3	0-7	88
CREAM-COLOURED VETCHLING (PEAVINE) *(Lathyrus ochroleucus)*	3	0-11	88
LINDLEY'S ASTER *(Aster ciliolatus)*	2	0-4	88
WILD LILY-OF-THE-VALLEY *(Maianthemum canadense)*	1	0-2	88
BUNCHBERRY *(Cornus canadensis)*	6	0-22	75
PALMATE-LEAVED COLTSFOOT *(Petasites palmatus)*	2	0-3	75
GRASSES			
HAIRY WILD RYE *(Elymus innovatus)*	4	0-6	88
WHITE-GRAINED MOUNTAIN RICE GRASS *(Oryzopsis asperifolia)*	2	0-5	75
PURPLE OAT GRASS *(Schizachne purpurascens)*	2	0-8	63
MOSSES			
Moss spp.	62	0-99	88

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC
NUTRIENT REGIME:
MESOTROPHIC
SOIL DRAINAGE:
WELL TO MODERATELY WELL
ELEVATION (MEAN):
853 - 1372 (1001)M

SLOPE: 1 - 3 %

FORAGE PRODUCTION (KG/HA) n=5

GRASS 103 (22-144)
FORBS 282 (100-480)
SHRUBS 154 (50-490)
TOTAL 539 (225-1114)

SUGGESTED GRAZING
3.4 HA/AUM

j11: White Spruce/ Buffalo-berry

(Picea glauca/ Shepherdia canadensis)

n=1 This community type is described by Beckingham and Archibald (1996) within the Boreal Mixedwood Subregion. The dominance of white spruce has restricted soil nutrient cyling and thereby reduced understory forage production. Due to the predominance of shrubs, creating a barrier to livestock access and poor forage production this community type is considered non-use for domestic grazing.

PLANT COMPOSITION

	CANOPY COVER(%) MEAN	RANGE		CONST.
TREES				
WHITE SPRUCE *(Picea glauca)*	65	-	100	
ASPEN *(Populus tremuloides)*	10	-	100	
PAPER BIRCH *(Betula papyrifera)*	5	-	100	
SHRUBS				
BUFFALO-BERRY *(Shepherdia canadensis)*	10	-	100	
ALDER *(Alnus crispa)*	5	-	100	
ROSE *(Rosa acicularis)*	2	-	100	
FORBS				
TWINFLOWER *(Linnaea borealis)*	7	-	100	
BUNCHBERRY *(Cornus canadensis)*	3	-	100	
COLTSFOOT *(Petasites palmatus)*	3	-	100	
SWEET-CICELY *(Osmorhiza chilensis)*	3	-	100	
ROUND-LEAVED WOOD VIOLET *(Viola orbiculata)*	2	-	100	

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC
NUTRIENT REGIME:
MESOTROPHIC
SOIL DRAINAGE:
WELL
ELEVATION: 880 M

FORAGE PRODUCTION (KG/HA)

GRASS	18
FORBS	46
SHRUBS	96
TOTAL	160

NON-USE

j12: White Spruce/ Moss

(Picea glauca/ Moss spp.)

n=18 This site represents a successionally mature white spruce stand. It is equivalent to Beckingham's (1993) Sw/Feathermoss community type. As these stands mature and the canopy becomes more closed, the amount of understory vegetation decreases until most of the shrub, forb, and grass layers have been eliminated and only shade-tolerant forbs and mosses remain.

It is unlikely that livestock would spend much time foraging in this community type because of the sparseness and low palatability of the vegetation. This community type would be considered non-use range. Even though foraging opportunities in this community type are limited, it may provide livestock with good shelter from harsh environmental elements (ie. sun, wind, rain, etc.).

PLANT COMPOSITION	CANOPY COVER(%) MEAN	RANGE	CONST.
TREES			
WHITE SPRUCE *(Picea glauca)*	57	7-85	100
ASPEN *(Populus tremuloides)*	3	0-10	78
SHRUBS			
ROSE *(Rosa acicularis)*	6	1-18	100
LOW BUSH-CRANBERRY *(Viburnum edule)*	1	0-4	44
BUFFALO-BERRY *(Shepherdia canadensis)*	1	0-5	39
BRACTED HONEYSUCKLE *(Lonicera involucrata)*	2	0-10	33
BOG CRANBERRY *(Vaccinium vitis-idaea)*	1	0-7	33
SNOWBERRY *(Symphoricarpos occidentalis)*	2	0-28	28
LABRADOR TEA *(Ledum groenlandicum)*	1	0-15	28
FORBS			
TWINFLOWER *(Linnaea borealis)*	4	0-18	94
STRAWBERRY *(Fragaria virginiana)*	3	0-7	89
CREAM-COLORED VETCHLING (PEAVINE) *(Lathyrus ochroleucus)*	2	0-7	78
LINDLEY'S ASTER *(Aster ciliolatus)*	2	0-6	78
BUNCHBERRY *(Cornus canadensis)*	7	0-34	72
BISHOP'S CAP *(Mitella nuda)*	3	0-9	72
GRASSES			
HAIRY WILD RYE *(Elymus innovatus)*	3	0-12	67
Marsh Reedgrass *(Calamagrostis canadensis)*	2	0-18	61
PURPLE OAT GRASS *(Schizachne purpurascens)*	1	0-10	28
WHITE-GRAINED MOUNTAIN RICE GRASS *(Oryzopsis asperifolia)*	1	0-14	22
MOSSES			
Moss spp.	67	9-96	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC
NUTRIENT REGIME:
MESOTROPHIC
SOIL DRAINAGE:
MODERATELY WELL TO WELL
ELEVATION (MEAN):
777 - 1219(994) M
SLOPE: 0 - 10 %

FORAGE PRODUCTION (KG/HA) n=12

GRASS	105 (10-318)
FORBS	307 (50-828)
SHRUBS	105 (0-270)
TOTAL	516 (70-1176)

SUGGESTED GRAZING
3.5 HA/AUM

j13: Engelmann Spruce-Lodgepole Pine/ Cow Parsnip

(Picea engelmannii-Pinus contorta / Heracleum lanatum)

n=1 This community type was found south of Sundre, close to the boundary between the Lower and Upper Foothills Subregions. It occurred on a microsite in which the vegetation had been influenced by a cold air drainage. The vegetation of this microsite resembled a subalpine plant community.

This community type was fairly open and productive and provided good livestock grazing opportunities.

PLANT COMPOSITION	CANOPY COVER(%) MEAN	RANGE	CONST.
TREES			
ENGELMANN SPRUCE *(Picea engelmannii)*	15	-	100
LODGEPOLE PINE *(Pinus contorta)*	5	-	100
SHRUBS			
GREEN ALDER *(Alnus crispa)*	10	-	100
RASPBERRY *(Rubus idaeus)*	5	-	100
MOUNTAIN GOOSEBERRY *(Ribes lacustre)*	5	-	100
ROSE *(Rosa acicularis)*	3	-	100
FORBS			
TALL LUNGWORT OR BLUEBELLS *(Mertensia paniculata)*	15	-	100
COW PARSNIP *(Heracleum lanatum)*	14	-	100
FIREWEED *(Epilobium angustifolium)*	4	-	100
BUNCHBERRY *(Cornus canadensis)*	4	-	100
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	26	-	100
HAIRY WILD RYE *(Elymus innovatus)*	5	-	100
PURPLE OAT GRASS *(Schizachne purpurascens)*	4	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBHYGRIC
NUTRIENT REGIME:
PERMESOTROPHIC
SOIL DRAINAGE:
MODERATELY WELL
ELEVATION: 1372 M

SLOPE: 30 %

ASPECT: NORTH

FORAGE PRODUCTION (KG/HA) n=1

GRASS	1490
FORBS	352
SHRUBS	172
TOTAL	2014

SUGGESTED GRAZING
0.9 HA/AUM

j14: White Spruce/ Willow- Bracted Honeysuckle

(Picea glauca/ Salix spp.- Lonicera involucrata)

n=2 This community type is similar to the Sw/bracted honeysuckle/fern community described by Beckingham et. al. (1996). A relatively high moisture/nutrient regime is apparent to the predominance of willow, honeysuckle and currant. This community is considered at best secondary range or non-use depending on the density of understory shrubs.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
WHITE SPRUCE *(Picea glauca)*	53	50-55	100
PAPER BIRCH *(Betula papyrifera)*	4	2-5	100
ASPEN *(Populus tremuloides)*	5	0-10	50
SHRUBS			
WILLOW *(Salix spp.)*	14	0-27	50
BRACTE HONEYSUCKLE *(Lonicera involucrata)*	21	5-37	100
ROSE *(Rosa acicularis)*	7	0-13	100
MOUNTAIN GOOSEBERRY *(Ribes lacustre)*	11	0-21	50
LOW BUSH-CRANBERRY *(Viburnum edule)*	3	0-6	50
BLUEBERRY OR WHORTLEBERRY *(Vaccinium myrtilloides)*	2	0-3	50
FORBS			
BUNCHBERRY *(Cornus canadensis)*	31	6-55	100
TWINFLOWER *(Linnaea borealis)*	7	6-8	100
BISHOP'S CAP *(Mitella nuda)*	7	10-13	100
COLTSFOOT *(Petasites palmatus)*	3	3-3	100
STRAWBERRY *(Fragaria virginiana)*	3	0-6	100
LINDLEY'S ASTER *(Aster ciliolatus)*	3	0-6	50
TALL LUNGWORT OR BLUEBELLS *(Mertensia paniculata)*	3	0-6	50
CREAM-COLOURED VETCHLING (PEAVINE) *(Lathyrus ochroleucus)*	3	0-5	50
FIREWEED *(Epilobium angustifolium)*	2	0-4	50
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	1	0-1	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
HYGRIC
NUTRIENT REGIME:
PERMESOTROPHIC
SOIL DRAINAGE:
IMPERFECTLY
ELEVATION: 754-884 M

FORAGE PRODUCTION (KG/HA) n=2

GRASS	63
FORBS	425
SHRUBS	159
TOTAL	646

SUGGESTED GRAZING
2.8 HA/AUM

j15: White Spruce/ Alder

(Picea glauca/ Alnus crispa)

n=1 A similar community type is described by Beckingham (1996) as a Sw/green alder-river alder/fern type. The presence of both green and river alder indicates a high moisture availability, likely found near natural drainages. The density of shrub cover will restrict the movement of livestock and thereby is considered secondary to non-use range.

PLANT COMPOSITION	CANOPY COVER(%) MEAN	RANGE	CONST.
TREES			
WHITE SPRUCE *(Picea glauca)*	65	-	100
BALSAM POPLAR *(Populus balsamifera)*	15	-	100
ASPEN *(Populus tremuloides)*	5	-	100
SHRUBS			
GREEN ALDER *(Alnus crispa)*	20	-	100
RIVER ALDER *(Alnus tenuifolia)*	6	-	100
ROSE *(Rosa acicularis)*	22	-	100
BRACTED HONEYSUCKLE *(Lonicera involucrata)*	19	-	100
LOW BUSH-CRANBERRY *(Viburnum edule)*	13	-	100
SASKATOON *(Amelanchier alnifolia)*	5	-	100
DOGWOOD *(Cornus stolonifera)*	3	-	100
WHITE MEADOWSWEET *(Spirea betulifolia)*	2	-	100
FORBS			
DEWBERRY OR RUNNING RASPBERRY *(Rubus pubescens)*	18	-	100
BUNCHBERRY *(Cornus canadensis)*	7	-	100
COLTSFOOT *(Petasites palmatus)*	5	-	100
LINDLEY'S ASTER *(Aster ciliolatus)*	4	-	100
TWINFLOWER *(Linnaea borealis)*	3	-	100
ONE-SIDED WINTERGREEN *(Orthilia secunda)*	2	-	100
FIREWEED *(Epilobium angustifolium)*	2	-	100
CREAM-COLOURED VETCHLING (PEAVINE) *(Lathyrus ochroleucus)*	2	-	100
STRAWBERRY *(Fragaria virginiana)*	1	-	100
TALL LUNGWORT OR BLUEBELLS *(Mertensia paniculata)*	1	-	100
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	3	-	100
MOSSES			
Moss spp.	12	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBHYGRIC
NUTRIENT REGIME:
PERMESOTROPHIC
SOIL DRAINAGE:
MODERATELY WELL
ELEVATION: 777 M

FORAGE PRODUCTION (KG/HA) n=1

GRASS	28
FORBS	332
SHRUBS	124
TOTAL	484

SUGGESTED GRAZING
3.8 HA/AUM

j16: Black Spruce - Lodgepole Pine/ Moss

(Picea mariana - Pinus contorta/ Moss)

n=5 This community type is characterized by dense coniferous forest cover and sparse understory cover. The sites that this community type occur on are moist in the spring and dry out, somewhat, later in the growing season. According to Corns and Annas (1986), these forests are rare due to the high fire frequency. They are part of the labrador tea ecosite by Beckinham et al (1996). This ecosite generally has subhygric to subxeric moisture regimes and relatively acidic surface soil conditions.

This community type would be considered as non-use range for livestock grazing because the dense coniferous cover reduces forage productivity to near zero and makes access difficult.

PLANT COMPOSITION

	CANOPY COVER (%)		
	MEAN	RANGE	CONST.
TREES			
BLACK SPRUCE *(Picea mariana)*	52	20-70	100
LODGEPOLE PINE *(Pinus contorta)*	24	6-40	100
SHRUBS			
LABRADOR TEA *(Ledum groenlandicum)*	8	0-25	80
ROSE *(Rosa acicularis)*	2	0-4	80
BOG CRANBERRY *(Vaccinium vitis-idaea)*	1	0-2	80
WILLOW *(Salix spp.)*	3	0-16	60
BLUEBERRY OR WHORTLEBERRY *(Vaccinium myrtilloides)*	1	0-3	60
SHRUBBY CINQUEFOIL *(Potentilla fruticosa)*	1	0-6	20
FORBS			
TWINFLOWER *(Linnaea borealis)*	15	0-50	100
BUNCHBERRY *(Cornus canadensis)*	6	0-9	100
STRAWBERRY *(Fragaria virginiana)*	1	0-3	60
LINDLEY'S ASTER *(Aster ciliolatus)*	1	0-2	40
FIREWEED *(Epilobium angustifolium)*	1	0-7	20
ALPINE MILK VETCH *(Astragalus alpinus)*	1	0-5	20
GRASSES			
SEDGES *(Carex spp.)*	6	0-27	60
HAIRY WILD RYE *(Elymus innovatus)*	2	0-5	60
BALTIC RUSH *(Juncus balticus)*	2	0-8	20
MOSSES			
Moss spp.	68	1-99	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC TO SUBHYGRIC
NUTRIENT REGIME:
MESOTROPHIC
SOIL DRAINAGE:
WELL TO POORLY
ELEVATION (MEAN):
835 - 1250 (1098)M
SLOPE: 0 - 9%

FORAGE PRODUCTION (KG/HA)

N/A

NON-USE

j17: White Spruce/ Horsetail/ Moss

(Picea glauca/ Equisetum pratense/ Moss)

n=2 This community is wet and nutrient rich, organic material tends to accumulate and forms a blanket of horsetail over the forest floor (Beckingham 1996),

This community type would be considered as non-use range for livestock grazing because the dense coniferous cover reduces forage productivity to near zero and makes access difficult. However, some behaviour studies on free-ranging horses indicates that horses selectively graze horsetails, notably *Equisetum scirpoides* and *E. variegatum* during the winter and *E. arvense* in the summer. Thereby these are favourable areas for horses provided there is not open native meadows or non-native pastures adjacent to these areas.

PLANT COMPOSITION

	CANOPY COVER (%) MEAN	RANGE	CONST.
TREES			
WHITE SPRUCE *(Picea glauca)*	58	45-70	100
PAPER BIRCH *(Betula papyrifera)*	8	0-15	50
SHRUBS			
BRACTED HONEYSUCKLE *(Lonicera involucrata)*	85	2-8	100
ROSE *(Rosa acicularis)*	2	1-3	100
WILD RED CURRANT *(Ribes triste)*	2	1-2	100
WILLOW *(Salix spp.)*	1	1-1	100
WILD GOOSEBERRY *(Ribes oxycanthoides)*	1	0-8	50
MOUNTAIN ASH *(Sorbus scopulina)*	1	0-2	50
FORBS			
HORSETAIL *(Equisetum pratense)*	58	45-70	100
(Equisetum sylvaticum)	15	0-30	50
(Equisetum arvense)	3	0-5	50
TWINFLOWER *(Linnaea borealis)*	3	2-4	100
BISHOP'S CAP *(Mitella nuda)*	3	1-5	100
BUNCHBERRY *(Cornus canadensis)*	2	1-3	100
COLTSFOOT *(Petasites palmatus)*	2	1-2	100
DEWBERRY OR RUNNING RASPBERRY *(Rubus pubescens)*	2	1-2	100
GRASSES			
MARSH REEDGRASS *(Calamagrostis canadensis)*	1	1-1	100
MOSSES			
Moss spp.	68	40-95	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
HYGRIC TO SUBHYDRIC
NUTRIENT REGIME:
PERMESOTROPHIC
SOIL DRAINAGE:
IMPERFECTLY TO POORLY
SLOPE: 1-2%

FORAGE PRODUCTION (KG/HA)

N/A

NON-USE

j18: Black Spruce/ Labrador tea/ Horsetail/ Moss

(Picea mariana/ Ledum groenlandicum/ Equisetum arvense/ Moss spp.)

n=2 This community type occurs in association with lowland bog areas. The water table under this community type is high during the entire growing season, but flooding is rare. Succession within this community type is to white spruce but is inhibited due to poor drainage, acidic soils, and oligotrophic conditions (Beckingham 1993). Therefore, this community type is considered to be successionally mature.

This community type consists mostly of unpalatable plant species, and therefore is of little use for domestic livestock grazing. It is a non-use area.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
BLACK SPRUCE *(Picea mariana)*	17	8-25	100
TAMARACK OR LARCH *(Larix laricina)*	2	0-4	50
LODGEPOLE PINE *(Pinus contorta)*	2	0-4	50
SHRUBS			
LABRADOR TEA *(Ledum groenlandicum)*	30	20-40	100
WILLOW *(Salix spp.)*	3	1-4	100
ROSE *(Rosa acicularis)*	6	1-10	100
BRACTED HONEYSUCKLE *(Lonicera involucrata)*	3	2-3	100
BOG CRANBERRY *(Vaccinium vitis-idaea)*	3	2-3	100
FORBS			
HORSETAIL *(Equisetum arvense)*	43	25-60	100
BUNCHBERRY *(Cornus canadensis)*	3	1-4	100
TWINFLOWER *(Linnaea borealis)*	2	2-2	100
COLTSFOOT *(Petasites palmatus)*	2	1-2	100
GRASSES			
MARSH REEDGRASS *(Calamagrostis canadensis)*	1	1-1	100
MOSSES			
Moss spp.	45	0-90	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBHYGRIC HYGRIC
NUTRIENT REGIME:
MESOTROPHIC TO PERMESOTHOPHIC
SOIL DRAINAGE:
IMPERFECTLY TO POORLY
SLOPE: 0 -4%

FORAGE PRODUCTION (KG/HA)

N/A

NON-USE

j19: Black Spruce/ Labrador Tea - Bog Cranberry/ Cloudberry

(Picea mariana/ Ledum groenlandicum - Vaccinium vitis-idaea/ Rubus chamaemoris)

n=10 This community type is similar to the Sb/Ledum/Rubus chamaemorus ecosystem association of Corns and Annas (1986). It is the result of infilling a bog with peat deposits as vegetation dies or by the accumulation of organic deposits in poorly drained terrain (Corns and Annas 1986). As this community type ages and accumulates more organic matter, it may move toward a drier Black Spruce/Labrador Tea/Moss community type.

Domestic livestock have no use for this community type because it is dominated by unpalatable plants and is too wet to be used for shelter. It is considered to be a non-use area for domestic livestock.

PLANT COMPOSITION

	CANOPY COVER(%) MEAN	RANGE	CONST.
TREES			
BLACK SPRUCE *(Picea mariana)*	36	0-60	100
TAMARACK OR LARCH *(Larix laricina)*	7	0-20	100
SHRUBS			
LABRADOR TEA *(Ledum groenlandicum)*	52	1-80	100
BOG CRANBERRY *(Vaccinium vitis-idaea)*	9	0-40	80
WILLOW *(Salix spp.)*	3	0-8	70
CLOUDBERRY *(Rubus chamaemorus)*	6	0-51	20
BOG BIRCH *(Betula glandulosa)*	8	0-34	60
FORBS			
FIELD HORSETAIL *(Equisetum arvense)*	1	0-4	50
SMALL BOG CRANBERRY *(Oxycoccus microcarpus)*	1	0-1	50
LINDLEY'S ASTER *(Aster ciliolatus)*	1	0-2	40
GRASSES			
SEDGE *(Carex spp.)*	3	0-18	40
BALTIC RUSH *(Juncus balticus)*	1	0-8	10
MOSSES			
Moss spp.	87	49-99	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBHYGRIC TO SUBHYDRIC
NUTRIENT REGIME:
MESOTROPHIC TO PERMESOTROPHIC
SOIL DRAINAGE:
MODERATELY WELL TO POORLY
ELEVATION (MEAN):
853 - 1037(955)M
SLOPE: 0-1%

FORAGE PRODUCTION (KG/HA) n=2

GRASS	23 (10-36)
FORBS	335 (302-368)
SHRUBS	786 (592-980)
TOTAL	1144 (996-1292)

NON-USE

j20: Black Spruce - Larch/ Sedge/ Moss

(Picea mariana - Larix laricina/ Carex spp./ Moss spp.)

n=17 This community type is associated with lowland bogs. It usually occurs just above wet sedge meadows and, therefore, the water table is usually at or near the soil surface in the spring and slightly below it for the remainder of the year. As organics accumulate and the site becomes drier, black spruce may eventually dominate the tree canopy (Beckingham 1993). Although tamarack benefits from the better drainage that results from sphagnum accumulation, it cannot tolerate the lack of nutrients and acidity that accompanies succession to black spruce dominance (Kocaoglu and Bennett 1983).

Since this community type is flooded in the spring it may provide a good source of fresh water for livestock during part of the year. But there are not many palatable plants in this community type and, therefore, it is considered to be non-use range.

PLANT COMPOSITION

	CANOPY COVER (%) MEAN	RANGE	CONST.
TREES			
BLACK SPRUCE *(Picea mariana)*	40	0-99	100
TAMARACK OR LARCH *(Larix laricina)*	11	0-45	65
SHRUBS			
WILLOW *(Salix spp.)*	9	0-34	94
LABRADOR TEA *(Ledum groenlandicum)*	9	0-35	59
BOG BIRCH *(Betula glandulosa)*	7	0-30	59
FORBS			
FIELD HORSETAIL *(Equisetum arvense)*	3	0-15	59
BISHOP'S CAP *(Mitella nuda)*	1	0-4	59
LINDLEY'S ASTER *(Aster ciliolatus)*	1	0-6	53
TWIN FLOWER *(Linnaea borealis)*	4	0-13	47
BUNCHBERRY *(Cornus canadensis)*	3	0-14	47
COLTSFOOT *(Petasites palmatus)*	1	0-4	47
WILD LILY-OF-THE-VALLEY *(Maianthemum canadense)*	2	0-18	35
THREE-LEAVED SOLOMON'S-SEAL *(Smilacina trifolia)*	2	0-12	24
GRASSES			
SEDGES *(Carex spp.)*	12	0-71	65
WATER SEDGE *(Carex aquatilis)*	8	0-53	29
BEAKED SEDGE *(Carex rostrata)*	8	0-51	29
THREE-LEAVED SEDGE *(Carex filifolia)*	2	0-15	12
MOSSES *Moss spp.*	74	0-99	88

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC TO HYDRIC
NUTRIENT REGIME:
SUBMESOTROPHIC TO EUTROPHIC
SOIL DRAINAGE:
WELL TO VERY POORLY
ELEVATION (MEAN):
747 - 1572 (980)M
SLOPE: 0-2 %

FORAGE PRODUCTION (KG/HA) n=9

GRASS	377 (45-1318)
FORBS	242 (10-528)
SHRUBS	137 (0-488)
TOTAL	757 (50-1318)

NON-USE

j21: Tamarack or Larch/ Bog Birch/ Sedge/ Moss

(Larix laricina/ Betula glandulosa/ Carex spp./ Moss spp.)

n=2 This community type is found on topographic low positions within minerotrophic peatlands. The water table is near the soil surface, although the flowing water creates a rich nutrient regime. The decomposition of the sedges and mosses creates a thick organic soil.

Due to the high water table and nutrient rich soils, forage production is often high, however it is considered unpalatable forage due with poor access.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
TAMARACK OR LARCH *(Larix laricina)*	26	1-20	100
BLACK SPRUCE *(Picea mariana)*	12	2-8	100
SHRUBS			
BOG BIRCH *(Betula glandulosa)*	15	5-25	100
LABRADOR TEA *(Ledum groenlandicum)*	13	1-25	100
WILLOW *(Salix spp.)*	6	0-10	50
BOG CRANBERRY *(Vaccinium vitis-idaea)*	2	0-3	50
FORBS			
MARSH MARIGOLD *(Caltha palustris)*	3	2-3	100
THREE-LEAVED SOLOMON'S-SEAL *(Smilacina trifolia)*	2	2-2	100
BISHOP'S-CAP *(Mitella nuda)*	1	1-1	100
ONE-FLOWERED WINTERGREEN *(Moneses uniflora)*	45	0-45	50
COMMON PINK WINTERGREEN *(Pyrola asarifolia)*	1	0-2	50
ARROW-GRASS *(Triglochin maritima)*	1	0-2	50
GRASSES			
WATER SEDGE *(Carex aquatilis)*	2	0-4	50
SEDGES *(Carex spp.)*	2	0-3	50
MOSSES			
Moss spp.	4	0-8	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBHYDRIC
NUTRIENT REGIME:
MESOTROPHIC
SOIL DRAINAGE:
POORLY TO VERY POORLY
SLOPE: 0%

FORAGE PRODUCTION (KG/HA)

N/A

Non-use

LOWER FOOTHILLS SUBREGION

GRAZED MODIFIED CONIFEROUS FOREST COMMUNITIES

Photo 16: A grazed modified, White Spruce/Kentucky Bluegrass/ Clover coniferous community type within the Lower Foothills Subregion. This section describes the effects of moderate to heavy grazing regimes on mature conferious forest community types. Normally these grazing effects are small in scale as livestock are confided by water, salting, corrals and/or fencing.

k1: Lodgepole Pine/ Kentucky Bluegrass/ Clover

(Pinus contorta/ Poa pratensis/ Trifolium spp.)

n=1 This community type represents a heavily-grazed Lodgepole pine/Blueberry or Bog Cranberry community type. Under heavy grazing pressure, the dominant native plant species decline, while grazing resistant plants like kentucky bluegrass and clover invade on to the site. Most lodgepole pine stands that have a farily good nutrient and moisture regime will move towards this community type when heavily grazed.

This community type will provide good grazing opportunities for domestic livestock because it is open, accessible, and contains palatable forage. It is probably near a cleared field or other feature that concentrates the cattle. The presence of this community type idicates some type of management problem and the management of the disposition should be examined.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
LODGEPOLE PINE *(Pinus contorta)*	55	-	100
ASPEN *(Populus tremuloides)*	2	-	100
SHRUBS			
BLUEBERRY OR WHORTLEBERRY *(Vaccinium myrtilloides)*	7	-	100
BOG CRANBERRY *(Vaccinium vitis-idaea)*	2	-	100
LOW BUSH CRANBERRY *(Viburnum edule)*	1	-	100
FORBS			
ALSIKE CLOVER *(Trifolium hybridum)*	30	-	100
DANDELION *(Taraxacum officinale)*	14	-	100
WILD LILY-OF-THE-VALLEY *(Maianthemum canadense)*	6	-	100
LINDLEY'S ASTER *(Aster ciliolatus)*	5	-	100
TWINFLOWER *(Linnaea borealis)*	3	-	100
EARLY BLUE VIOLET *(Viola adunca)*	2	-	100
GRASSES			
KENTUCKY BLUEGRASS *(Poa pratensis)*	44	-	100
PURPLE OAT GRASS *(Schizachne purpurascens)*	11	-	100
HAIRY WILD RYE *(Elymus innovatus)*	4	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC
NUTRIENT REGIME:
MESOTROPHIC
SOIL DRAINAGE:
WELL
ELEVATION: 1143 M

SLOPE: LEVEL

FORAGE PRODUCTION (KG/HA) n=1

GRASS	336
FORBS	672
SHRUBS	336
TOTAL	1344

SUGGESTED GRAZING
3.0 HA/AUM

k2: White Spruce/ Kentucky Bluegrass/ White Clover

(Picea glauca/ Poa pratensis/ Trifolium repens)

n=2 This community type represents a heavily-grazed white spruce stand. Overgrazing has caused a reduction in the native plant species and an increase in grazing resistant species (ie. clover and dandelion). Most heavily-grazed white spruce stands that are fairly open and have a small deciduous component will move towards this community type.

Most white spruce stands do not provide much forage for grazing. However, this site was near a good source of water and a grassy clearing, which concentrated the livestock into the area.

PLANT COMPOSITION

	CANOPY COVER(%) MEAN	RANGE	CONST.
TREES			
WHITE SPRUCE *(Picea glauca)*	38	23-50	100
ASPEN *(Populus tremuloides)*	8	0-15	50
BALSAM POPLAR *(Populus balsamifera)*	4	0-8	50
SHRUBS			
SNOWBERRY *(Symphoricarpos occidentalis)*	4	0-6	100
ROSE *(Rosa acicularis)*	3	0-5	50
WILLOW *(Salix spp.)*	3	0-5	50
FORBS			
WHITE CLOVER *(Trifolium repens)*	38	21-55	100
DANDELION *(Taraxacum officinale)*	19	6-31	100
LINDLEY'S ASTER *(Aster ciliolatus)*	10	0-18	100
COMMON YARROW *(Achillea millefolium)*	4	0-8	100
STRAWBERRY *(Fragaria virginiana)*	3	0-5	100
VEINY MEADOW RUE *(Thalictrum venulosum)*	2	0-3	50
CANADA VIOLET *(Viola canadensis)*	1	0-2	50
GRASSES			
KENTUCKY BLUEGRASS *(Poa pratensis)*	19	0-37	50
MOSSES			
Moss spp.	8	0-16	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC
NUTRIENT REGIME:
PERMESOTROPHIC
SOIL DRAINAGE:
WELL
ELEVATION: 950 M

SLOPE: LEVEL

FORAGE PRODUCTION (KG/HA) n=1

GRASS	48
FORBS	598
SHRUBS	132
TOTAL	778

SUGGESTED GRAZING
3.7 HA/AUM

LOWER FOOTHILLS SUBREGION

FOREST CUTBLOCK COMMUNITIES

Photo 17: An Aspen/ Marsh Reed Grass/ Rose/ Fireweed cutblock community within the Lower Foothills Subregion. This community type was developed after an Aw/Rose dominated stand was logged. Forage production increased following logging, and can restrict livestock access, but will decrease as aspen densities decline.

Cutblocks

Forest harvesting affects the understory community through removal of the tree overstory as well as root destruction, soil compaction, scarification, forest floor displacement, and understory destruction. These mechanical disturbances can alter the energy flows between soil and plants which can alter the tree regeneration, species diversity and production. Logging will often increase understory production by reduced competition of understory species for light and nutrients. This increase in production is not included in the calculation of the overall carrying capacity of the disposition because these increases are only temporary. To determine the rates (ha/AUM) for grazing on harvested cutblocks the carrying capacity is based on the undisturbed mature stand (summarized by the ecosite phase). For example, l5 Aw/marsh reed grass/ rose/fireweed has an average production at 2-8 years following harvesting of 2154 kg/ha; however to ensure sustainable timber and forage production the livestock stocking is measured from e2 ecosite phase production of 917 kg/ha or 2.0 ha/AUM (Table 13).

Although cutblocks can be productive primary range for both livestock and wildlife, careful management of these areas is required to ensure that forest regeneration is successful. It is undeniable that both livestock and wildlife can cause damage to regenerating forests and in extreme situations can threaten regeneration. However, with good range management cutblocks can be grazed without seriously affecting forest regeneration and in some instances grazing can promote regeneration by removing competing vegetation.

This section describes the types of forested cutblocks found to be common throughout the Lower Foothills Subregion, this community types provide some base-line information to integrate the management of domestic livestock with forest regeneration practices. The community types were numbered sequentially from l1-l17 (Tables 1a and 13) based on an understanding of how these communities would link into the ecosite classification system identified by The Ecosite Guides of West-Central (Beckingham et. al. 1996) and Southwestern Alberta (Archibald et. al. 1996). This attempts to bridge the gap of understanding between forest and range management practioners by recognizing the values of both forage and fibre production. It is recommended that integrating range and forest resources should occur using the information provided in the ecosite phase summary (Table 13). Ecosite phase summary tables are provided for the more common community types, i.e. e2_harvest Aw and f2_harvest Aw-Pb.

Table 12. Forage production summary for forest cutblock community types of the Lower Foothills subregion

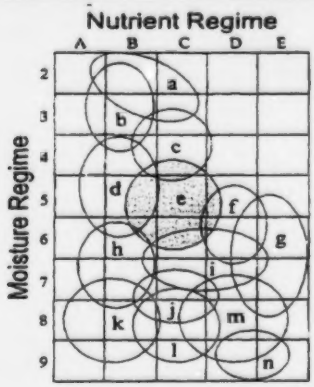
Ecosite	Community number	Community type	Productivity (kg/ha)				sample size (n)	Suggested Grazing (ha/AUM)
			Grass	Forb	Shrub	Total		
c hairy wild rye submesic/ medium	**Ecosite phase**	**c1 hairy wild rye Pl**	**220**	**196**	**104**	**495**	**12**	**3.7**
	Ecosite phase	**c1_harvest Pl**	**293**	**309**	**284**	**886**	**2**	**3.7**
	l1	WGMG/bearberry/Pl-Aw	293	309	284	886	2	3.7
	Ecosite phase	**c3 hairy wild rye Aw-Sw-Pl**	**258**	**180**	**120**	**558**	**2**	**3.3**
	Ecosite phase	**c3_harvest Aw-Sw-Pl**	**1786**	**111**	**232**	**2129**	**2**	**3.3**
	l2	Aw/hairy wild rye/dwarf bilberry-labrador tea	1786	111	232	2129	2	3.3
	Ecosite phase	**c4 hairy wild rye Sw**	**146**	**198**	**124**	**468**	**5**	**3.9**
	Ecosite phase	**c4_harvest Sw**	**432**	**765**	**222**	**1419**	**2**	**3.9**
	l3	buffalo-berry/bearberry/Sw	432	765	222	1419	2	3.9
e low-bush cranberry mesic/ medium	**Ecosite phase**	**e1 low-bush cranberry Pl**	**200**	**350**	**60**	**610**	**1**	**3.0**
	Ecosite phase	**e1_harvest Pl**	**578**	**419**	**88**	**1084**	**9**	**3.0**
	l4	Pl/hairy wild rye/rose	578	419	88	1084	9	3.0
	Ecosite phase	**e1_harvest_grazed Pl**	**885**	**821**	**503**	**2210**	**3**	**3.0**

Ecosite	Community number	Community type	Productivity (kg/ha)				sample size (n)	Suggested Grazing (ha/AUM)
			Grass	Forb	Shrub	Total		
	m1	Aw-Pl/alder/clover/kentucky bluegrass	885	821	503	2210	3	3.0
	Ecosite phase	**e2 low-bush cranberry Aw**	**275**	**435**	**206**	**917**	**116**	**2.0**
	Ecosite phase	**e2_harvest Aw**	**766**	**803**	**516**	**2084**	**16**	**2.0**
	l5	Aw/marsh reedgrass/rose/fireweed	722	806	515	2044	15	2.0
	l6	raspberry/marsh reedgrass/Aw	n/a	n/a	n/a	2300*	0	2.0
	l7	beaked hazelnut/Aw/wild sarsaparilla	742	190	104	1036	1	2.0
	Ecosite phase	**e2_harvest_grazed Aw**	**834**	**382**	**202**	**1418**	**9**	**2.0**
	m2	Aw/buffalo-berry/clover	n/a	n/a	n/a	1200*	0	2.0
	m3	strawberry-clover/rose/marsh reedgrass	405	331	541	1277	3	2.0
	m4	kentucky bluegrass/clover-dandelion	1048	408	33	1489	6	2.0
	Ecosite phase	**e3 low-bush cranberry Aw-Sw-Pl**	**195**	**345**	**210**	**750**	**69**	**2.4**
	Ecosite phase	e3_harvest Aw-Sw-Pl	240	116	1400	1756	1	2.4
	l8	Aw/willow/purple oatgrass/dwarf bilberry	240	116	1400	1756	1	2.4

Ecosite	Community number	Community type	Productivity (kg/ha)				sample size (n)	Suggested Grazing (ha/AUM)
			Grass	Forb	Shrub	Total		
	Ecosite phase	**e3_harvest_grazed Aw-Sw-Pl**	**3090**	**658**	**322**	**4070**	**1**	**2.4**
	m5	clover/timothy/buffalo-berry/Pl-Sw	3090	658	322	4070	1	2.4
	Ecosite phase	**e4 low-bush cranbery Sw**	**98**	**287**	**104**	**489**	**13**	**3.7**
	Ecosite phase	**e4_harvest Sw**	**1184**	**455**	**116**	**1755**	**4**	**3.7**
	l9	moss/marsh reedgrass	1184	455	116	1755	4	3.7
f bracted honeysuckle subhygric/ rich	**Ecosite phase**	**f2 bracted honyesuckle Aw-Pb**	**365**	**532**	**316**	**1244**	**138**	**1.5**
	Ecosite phase	**f2_harvest Aw-Pb**	**1733**	**1117**	**175**	**4008**	**3**	**1.5**
	l10	Aw/bracted honeysuckle/horsetail	n/a	n/a	n/a	2500*	0	1.5
	l11	marsh reedgrass/Pb/wild raspberry/fireweed	1853	1044	53	4424	2	1.5
	l12	Pb/green alder/marsh reedgrass	n/a	n/a	n/a	2750*	0	1.5
	l13	marsh reedgrass/Bw-Aw/willow	1492	1264	420	3176	1	1.5
	Ecosite phase	**f3 bracted honeysuckle Aw-Sw-Pl**	**1490**	**352**	**172**	**2014**	**1**	**1.5**
	Ecosite phase	**f3_harvest Aw-Sw-Pl**	**325**	**1210**	**1075**	**2610**	**2**	**2.0**
	l14	fireweed/green alder/Pl-Sw	325	1210	1075	2610	2	2.0
	Ecosite phase	**f4 bracted honeysuckle Sw**	**51**	**394**	**147**	**592**	**3**	**3.1**

Ecosite	Community number	Community type	Productivity (kg/ha)				sample size (n)	Suggested Grazing (ha/AUM)
			Grass	Forb	Shrub	Total		
	Ecosite phase	**f4_harvest Sw**	**761**	**846**	**1**	**1608**	**1**	**3.1**
	l15	Sw/willow/marsh reedgrass	761	846	1	1608	1	3.1
h labrador tea-subhygric subhygric/ poor	**Ecosite phase**	**h1 labrador tea Sb-Pl**	**n/a**	**n/a**	**n/a**	**n/a**	**0**	**non-use**
	Ecosite phase	**h1_harvest Sb-Pl**	**n/a**	**n/a**	**n/a**	**n/a**	**0**	**non-use**
	l16	Pl-Sb/labrador tea/horsetail/moss	n/a	n/a	n/a	n/a	0	non-use
j labrador tea/ horsetail hygric/ medium	**Ecosite phase**	**j1 labrador tea/horestail Sb-Sw**	**n/a**	**n/a**	**n/a**	**n/a**	**0**	**non-use**
	Ecosite phase	**j1_harvest Sb-Sw**	**n/a**	**n/a**	**n/a**	**n/a**	**0**	**non-use**
	l17	willow/hair-like sedge/Sw	n/a	n/a	n/a	n/a	0	non-use

e2 low-bush cranberry_harvest Aw n=43



CHARACTERISTIC SPECIES

Tree [22] aspen
[3] balsam poplar*
[1] white birch*
[1] white spruce*

Shrub [8] prickly rose
[6] wild red raspberry
[4] bracted honeysuckle
[4] green alder
[3] low-bush cranberry
[2] aspen*
[1] beaked hazelnut*
[1] snowberry*
[1] saskatoon*

Forb [7] fireweed
[5] wild strawberry
[3] palmate-leaved coltsfoot
[3] dewberry
[3] wild sarsaparilla
[3] lindley's aster
[3] bunchberry
[2] northern bedstraw
[2] tall lungwort
[2] cream-colored vetchling
[1] american vetch

Grass [20] marsh reedgrass

SITE CHARACTERTISTICS

Moisture Regime: subhyric[4], mesic[2]
Nutrient Regime: rich[4], medium[2]
Topographic Position: lower slope[3], mid slope[1], upper slope[2]
Slope: (2-5)[4], (10-15)[2]
Aspect: northerly[3], westerly[3]

SOIL CHARACTERISTICS**

Organic Thickness: (6-15)[6], (0-5)[4]
Humus Form: mor[6], raw moder[3]
Surface Texture: SiL[2], SL[2], L[1], Si[1]
Effective Texture: C[3],CL[2], SCL[1], SiC[1], SiCL[1]
Depth to Mottles/Gley: none[7], (0-25)[2]
Drainage: well[5], mod.well[4], imperfect[1]
Parent Material: M[5], GF[1]
Soil Subgroup: O.GL[3], BR.GL[3], GL.GL[1], E.EB[1]
Soil type: SM4[8], SD4[1]

PLANT COMMUNITY TYPES (N)

15 Aw/marsh reedgrass/rose/fireweed (39)
16 raspberry/marsh reedgrass/Aw (2)
17 beaked hazelnut/Aw/wild sarsaparilla (2)

FORAGE PRODUCTION (KG/HA) n=16

Grass 766 (150-1600)
Forb 803 (120-1616)
Shrub 516 (52-1782)
Total 2084 (1036-3992)

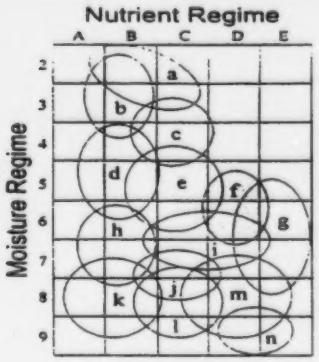
SUGGESTED GRAZING HA/AUM

Cutblock Regeneration (e2_Aw):2.0

* Species characteristic of the phase but occurring in <70% of the sample plots with a prominence value <20.

** Soil Characteristics are from e2 low-bush cranberry Aw Ecosite Phase summary.

f2 bracted honeysuckle_ harvest Aw-Pb n=6



CHARACTERISTIC SPECIES

Tree

[10] balsam poplar
[8] aspen
[4] white birch*
[2] white spruce*

Shrub

[8] wild red raspberry
[5] willow*
[4] aspen*
[4] green alder*
[4] bracted honeysuckle*
[3] prickly rose
[2] currant*
[1] balsam poplar*
[1] low-bush cranberry*

Forb

[9] common horsetail
[4] fireweed
[4] tall lungwort
[3] Lindley's aster
[3] cowparsnip*
[2] wild sarsaparilla*
[2] showy aster
[2] palmate-leaved coltsfoot
[2] wild strawberry
[1] dewberry
[1] common dandelion

Grass

[18] marsh reedgrass

SITE CHARACTERTISTICS

Moisture Regime: subhyric[7], mesic[3]
Nutrient Regime: rich[7], medium[3]
Topographic Position: lower slope[5], mid slope[2], upper slope[3]
Slope: (2-5)[7], (10-15)[3]
Aspect: northerly[5], westerly[5]

SOIL CHARACTERISTICS**

Organic Thickness: (6-15)[7], (0-5)[3]
Humus Form: mor[7], raw moder[3]
Surface Texture: SiL[4], L[1], SL[1], CL[1], SiCL[1]
Effective Texture: C[3],SiCL[1], SiC[1], hC[1], SC[1],CL[1]
Depth to Mottles/Gley: none[4], (0-25)[4], (26-50)[1]
Drainage: imperfect[3], mod.well[3],well[2], poor[1]
Parent Material: M[4], GF[1], F[1]
Soil Subgroup: O.LG[2],GL.GL[1], BR.GL[1], O.EB[1], E.EB[1]
Soil type: SM4[7], SWm[1]

PLANT COMMUNITY TYPES (N)

l10 Aw/bracted honeysuckle/horsetail (1)
l11 marsh reedgrass/Pb/wild raspberry/fireweed (2)
l12 Pb/green alder/marsh reedgrass (1)
l13 marsh reedgrass/Bw-Aw/willow (2)

FORAGE PRODUCTION (KG/HA) N=3

Grass 1733 (432-3274)
Forb 1117 (1044-1264)
Shrub 175 (0-420)
Total 4008 (3176-4424)

SUGGESTED GRAZING HA/AUM

Cutblock Regeneration (f2 Aw-Pb): 1.5

* Species characteristic of the phase but occurring in <70% of the sample plots with a prominence value <20. ** Soil Characteristics are from f2 bracted honeysuckle Aw-Pb Ecosite Phase summary

11: Lodgepole Pine- Aspen/ Bearberry/ White-grained Mountain Rice Grass

(Pinus contorta- Populus tremuloides/ Arctostaphylos uva-ursi/ Oryzopsis asperifolia)

n=2 This community type represents a clear-cut lodgepole pine forest which is regenerating to both pine and aspen. The predominanace of white-grained mountain rice grass in this community type may be related to disturbance from fire or grazing. It appears that white-grained mountain rice grass increases in abundance with moderate grazing.

The openness of the shrub layer in this community type allows for good livestock access. Therefore, this community type can be considered primary range for livestock grazing if it occurs near water or other primary rangelands. If this community type does not occur near water or other primary rangeland it can be considered as secondary rangeland. This community type is in good condition.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
WILLOW *(Salix spp.)*	10	6-14	100
BEARBERY *(Arctostaphylos uva-ursi)*	5	0-10	50
LABRADOR TEA *(Ledum groenlandicum)*	3	1-5	100
ROSE *(Rosa acicularis)*	3	2-3	100
BUCKBRUSH OR SNOWBERRY *(Symphoricarpos occidentalis)*	3	0-5	50
LODGEPOLE PINE SAPLINGS *(Pinus contorta)*	3	2-3	100
ASPEN SAPLINGS *(Populus tremuloides)*	2	0-2	100
TWINFLOWER *(Linnaea borealis)*	5	2-7	100
FORBS			
CREAM-COLORED VETCHLING (PEAVINE) *(Lathyrus ochroleucus)*	5	4-4	100
LINDLEY'S ASTER *(Aster ciliolatus)*	5	4-5	100
STRAWBERRY *(Fragaria virginiana)*	4	1-6	100
FIREWEED *(Epilobium angustifolium)*	4	0-6	100
NORTHERN GENTIAN *(Gentiana amarella)*	1	0-1	100
WILD LILY-OF-THE-VALLEY *(Maianthemum canadense)*	1	0-1	100
PALMATE-LEAVED COLTSFOOT *(Petasites palmatus)*	1	0-2	100
GRASSES			
WHITE-GRAINED MOUNTAIN RICE GRASS *(Oryzopsis asperifolia)*	24	18-30	100
HAIRY WILD RYE *(Elymus innovatus)*	12	5-18	100
MARSH REED GRASS *(Calamagrostis canadensis)*	4	0-7	100
MOSSES *Moss spp.*	22	20-23	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC
NUTRIENT REGIME:
MESOTROPHICTO PERMESOTROPHIC
SOIL DRAINAGE:
WELL
ELEVATION (MEAN):
960 -1204 (1082)M
SLOPE: 0 - 15 %

FORAGE PRODUCTION (KG/HA) N=2

GRASS	293 (136-450)
FORBS	309 (210-408)
SHRUBS	284 (267-300)
TOTAL	886 (811-960)

SUGGESTED GRAZING
3.7 HA/AUM

- 12: Aspen/ Dwarf Bilberry- Labrador Tea/ Hairy Wild Rye

(Populus tremuloides/ Vaccinium caespitosum- Ledum groenlandicum/ Elymus innovatus)

n=5 This community type formed by clear-cut logging a mature mixed stand of white spruce - aspen and perhaps logdepole-pine. After harvest the aspen suckered vigorously and have established dominance. While there is still a good number of white spruce saplings, they will not become dominant until the aspen has undergone natural thinning to allow the white spruce some room and light to grow.

The abundance of hairy wild rye, dwarf bilberry, and labrador tea indicate that this site has poor soil nutrients.

This community type is in good range condition because it has maintained a high abundance of native vegetation.

PLANT COMPOSITION

	CANOPY COVER(%) MEAN	RANGE	CONST.
SHRUBS			
ASPEN SAPLINGS *(Populus tremuloides)*	38	0-80	80
WHITE SPRUCE SAPLINGS *(Picea glauca)*	10	0-50	40
DWARF BILBERRY *(Vaccinium caespitosum)*	8	3-14	100
ROSE *(Rosa acicularis)*	5	1-13	100
LABRADOR TEA *(Ledum groenlandicum)*	4	0-12	100
BLUEBERRY *(Vaccinium myrtilloides)*	3	0-12	20
GREEN ALDER *(Alnus crispa)*	2	0-10	20
FORBS			
BUNCHBERRY *(Cornus canadensis)*	8	0-19	100
STRAWBERRY *(Fragaria virginiana)*	7	1-11	100
WILD LILY-OF-THE-VALLEY *(Maianthemum canadense)*	4	0-7	100
FIREWEED *(Epilobium angustifolium)*	4	0-6	100
NORTHERN BEDSTRAW *(Galium boreale)*	3	0-7	100
GRASSES			
HAIRY WILD RYE *(Elymus innovatus)*	11	4-16	100
MARSH REED GRASS *(Calamagrostis canadensis)*	12	0-45	60
PINE GRASS *(Calamagrostis rubescens)*	6	0-18	40
PURPLE OAT GRASS *(Schizachne purpurascens)*	3	0-7	100
UPLAND SEDGES *(Carex spp.)*	2	0-3	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBMESIC TO MESIC
NUTRIENT REGIME:
MESOTROPHIC
SOIL DRAINAGE:
MODERATELY WELL
ELEVATION (MEAN):
792 - 1143 (966)M
SLOPE: 0 - 6 %
ASPECT: VARIABLE

FORAGE PRODUCTION (KG/HA) N=2

GRASS	1786 (1616-1956)
FORBS	111 (98-124)
SHRUBS	232 (192-272)
TOTAL	2129 (2012-2246)

SUGGESTED GRAZING
3.3 HA/AUM

I3: White Spruce/ Buffalo-berry- Bearberry

(Picea glauca/ Shepherdia canadensis- Arctostaphylos uva-ursi)

n=2 This community type is formed by clear-cut logging a White Spruce/Buffalo-berry/Bearberry community type. By removing the tree canopy the grass and forb layers have increased significantly due to the higher availability of sunlight. Clear-cutting also removes the physical barriers that occur with forested conditions. The removal of physical barriers and the increased understory production, has made this site more useful to grazing livestock.

If this community type occurs near a good water source it will probably become primary range. This community type is considered to be in excellent range condition.

PLANT COMPOSITION

	CANOPY COVER(%) MEAN	RANGE	CONST.
TREES			
WHITE SPRUCE *(Picea glauca)*	3	0-5	50
BALSAM POPLAR *(Populus balsamifera)*	2	0-3	50
SHRUBS			
BUFFALOBERRY *(Shepherdia canadensis)*	12	0-22	100
BEARBERRY *(Arctostaphylos uva-ursi)*	10	1-17	100
ROSE *(Rosa acicularis)*	4	3-5	100
WHITE SPRUCE SAPLINGS *(Picea glauca)*	2	1-2	100
BALSAM POPLAR SAPLINGS *(Populus balsamifera)*	1	0-1	50
FORBS			
STRAWBERRY *(Fragaria virginiana)*	14	9-19	100
AMERICAN VETCH *(Vicia americana)*	7	0-12	100
CLOVER *(Trifolium spp.)*	5	3-6	100
NORTHERN BEDSTRAW *(Galium boreale)*	3	1-4	100
COMMON YARROW *(Achillea millefolium)*	2	0-2	100
AMERICAN HEDYSARUM *(Hedysarum alpinum)*	2	0-3	50
STAR-FLOWERED SOLOMON'S SEAL *(Smilacina stellata)*	1	0-1	50
GRASSES			
HAIRY WILD RYE *(Elymus innovatus)*	25	8-42	100
NORTHERN AWNLESS BROME *(Bromus pumpellianus)*	15	0-30	50
KENTUCKY BLUEGRASS *(Poa pratensis)*	3	0-5	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC
NUTRIENT REGIME:
MESOTROPHIC
SOIL DRAINAGE:
WELL
ELEVATION (MEAN):
976-1100 (1038)M
SLOPE : 1-5%
ASPECT: EASTERLY

FORAGE PRODUCTION (KG/HA) N=2

GRASS	432 (374-490)
FORBS	765 (732-798)
SHRUBS	222 (118-326)
TOTAL	1419 (1224-1614)

SUGGESTED GRAZING
3.9 HA/AUM

14: Lodgepole pine/ Rose/ Hairy Wild Rye

(Pinus contorta/ Rosa acicularis/ Elymus innovatus)

n=12 This community type was formed by clear-cut logging a lodgepole pine forest approximately ten years ago. After clear-cutting, aspen did not sucker vigorously on this site because of the nutrient poor, sandy soils. Because aspen did not take over the site, lodgepole pine was able to reestablish its dominance. The nutrient poor, sandy soil conditions also favor the growth of dwarf bilberry and hairy wild rye, which are codominants on the site.

This community type may provide some grazing opportunities, but the dense growth of lodgepole pine and aspen make access difficult and limit understory production. At best, this community type would provide some secondary range for livestock grazing.

This community type is in good range condition.

PLANT COMPOSITION — CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
LODGEPOLE PINE SAPLINGS *(Pinus contorta)*	11	0-50	67
ASPEN SAPLINGS *(Populus tremuloides)*	6	0-45	75
ROSE *(Rosa acicularis)*	3	0-10	100
DWARF BILBERRY *(Vaccinium caespitosum)*	4	0-27	67
BEARBERRY *(Arctostaphylos uva-ursi)*	4	0-12	67
BOG CRANBERRY *(Vaccinium vitis-idaea)*	2	0-10	58
FORBS			
FIREWEED *(Epilobium angustifolium)*	4	0-16	92
BUNCHBERRY *(Cornus canadensis)*	2	0-5	92
WILD LILY-OF-THE-VALLEY *(Maianthemum canadense)*	2	0-4	83
DANDELION *(Taraxacum officinale)*	1	0-8	83
TWINFLOWER *(Linnaea borealis)*	1	0-5	75
LINDLEY'S ASTER *(Aster ciliolatus)*	1	0-7	58
WILD STRAWBERRY *(Fragaria virginiana)*	2	0-14	50
GRASSES			
HAIRY WILD RYE *(Elymus innovatus)*	10	2-17	100
SEDGE *(Carex spp.)*	3	0-15	75
MARSH REED GRASS *(Calamagrostis canadensis)*	4	0-14	58
MOSSES			
Moss spp.	27	0-54	83

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUBMESIC TO MESIC
NUTRIENT REGIME:
MESOTROPHIC
SOIL DRAINAGE:
WELL
ELEVATION (MEAN):
1143 -1572 (1214)M
SLOPE: 0 - 5%
ASPECT: SOUTHERLY

FORAGE PRODUCTION (KG/HA) N=10

GRASS	578 (104-1550)
FORBS	419 (42-964)
SHRUBS	88 (16-288)
TOTAL	1084 (186-2468)

SUGGESTED GRAZING
3.0 HA/AUM

15: Aspen/ Rose/ Fireweed/ Marsh Reed Grass

(Populus tremuloides/ Rosa acicularis/ Epilobium angustifolium/ Calamagrostis canadensis)

n=39 This community type formed after clear-cut logging an Aspen/Rose community type. The logging probably occurred two to eight years ago. After logging, more light reaches the understory and grasses and forbs are able to flourish. As the aspen reestablishes itself, it rapidly gains dominance on the site. As aspen forms and fills in an overstory canopy, marsh reed grass will decline and rose, along with other shrubs and forbs, will become more abundant.

This community type provides fairly good grazing opportunities in its early stages, but gradually excludes grazing livestock as the aspen saplings grow taller and form barriers to livestock movement through the area.

This community type is in good to excellent range condition.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	25	0-80	92
BALSAM POPLAR *(Populus balsamifera)*	3	0-26	49
WHITE OR PAPER BIRCH *(Betula papyrifera)*	2	0-4	33
SHRUBS			
ROSE *(Rosa acicularis)*	8	0-28	100
BRACTED HONEYSUCKLE *(Lonicera involucrata)*	5	0-27	80
LOW BUSH CRANBERRY *(Viburnum edule)*	3	0-15	90
RASPBERRY *(Rubus idaeus)*	5	0-19	74
TREMBLING ASPEN SAPLINGS *(Populus tremuloides)*	2	0-20	15
FORBS			
FIREWEED *(Epilobium angustifolium)*	7	0-14	97
STRAWBERRY *(Fragaria virginiana)*	5	0-12	90
NORTHERN BEDSTRAW *(Galium boreale)*	2	0-7	85
CREAM-COLORED VETCHLING (PEAVINE) *(Lathyrus ochroleucus)*	2	0-9	82
PALMATE-LEAVED COLTSFOOT *(Petasites palmatus)*	3	0-13	92
DEWBERRY OR RUNNING RASPBERRY *(Rubus pubescens)*	3	0-17	87
BUNCHBERRY *(Cornus canadensis)*	3	0-15	85
LINDLEY'S ASTER *(Aster ciliolatus)*	3	0-11	85
WILD SARSAPARILLA *(Aralia nudicaulis)*	3	0-13	80
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	21	0-56	95

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC
NUTRIENT REGIME:
MESOTROPHIC TO PERMESOTROHIC
SOIL DRAINAGE:
MODERATELY WELL TO WELL
ELEVATION (MEAN):
754 - 1143 (937)M
SLOPE: 0 -35%
ASPECT: SOUTHEASTERLY

FORAGE PRODUCTION (KG/HA) N=15

GRASS	722 (42-1600)
FORBS	806 (120-1616)
SHRUBS	515 (52-1782)
TOTAL	2044 (386-3992)

SUGGESTED GRAZING
2.0 HA/AUM

16:Raspberry/ Marsh Reed Grass/ Aspen

(Rubus idaeus/ Calamagrostis canadensis/ Populus tremuloides)

n=2 This community type represents an Aspen / Alder or Aspen / Rose community type that has been harvested, scarified, and planted to white spruce seedlings . This additional ground disturbance was created to provide suitable microsites for white spruce seedling establishment; however, with the dominance of raspberry and marsh reed grass these planted seedlings were unsuccessfully established. This community provides good grazing opportunities in its early stages after harvest, but as the trembling aspen and shrubs grow taller they form barriers that exclude livestock by limiting their movement. This community type is in good condition.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
ASPEN			
(Populus tremuloides)	6	4-7	100
WHITE OR PAPER BIRCH			
(Betula papyrifera)	5	3-5	100
SHRUBS			
RASPBERRY			
(Rubus idaeus)	18	15-21	100
ROSE			
(Rosa acicularis)	3	0-6	100
FORBS			
RED CLOVER			
(Trifolium pratense)	4	0-8	100
FIREWEED			
(Epilobium angustifolium)	3	2-3	100
WILD SARSAPARILLA			
(Aralia nudicaulis)	2	2-2	100
DANDELION			
(Taraxicum officianalis)	2	0-3	100
STRAWBERRY			
(Fragaria virginiana)	2	2-2	100
SHOWY ASTER			
(Aster conspicuous)	1	0-1	100
FIELD HORSETAIL			
(Equisetum arvense)	2	0-4	50
GRASSES			
MARSH REED GRASS			
(Calamagrostis canadensis)	9	6-12	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC
NUTRIENT REGIME:
MESOTROPHIC
SOIL DRAINAGE:
WELL
ELEVATION:
920-940 M
SLOPE: 2%
ASPECT: WESTERLY

FORAGE PRODUCTION (KG/HA)

TOTAL 2300*
(*ESTIMATED)

SUGGESTED GRAZING
2.0 HA/AUM

I7: Beaked Hazelnut/Aspen/Wild Sarsaparilla

(Corylus cornuta/Populus tremuloides/Aralia nudicaulis)

n=2 This community type formed after clear-cutting an Aw/hazelnut/wild sarsaparilla forest community type. The presence of beaked hazelnut appears to be indicative of warmer sites that may have some fire history (Downing and Karpuk 1992). The opening of the canopy after logging seems to have allowed hazelnut to proliferate, possibly due to the increased light penetration and thus an increase in temperature. As aspen continues to mature, hazelnut may decline.

This community type would be considered secondary or non-use range for domestic livestock due to the limited access caused by the thick hazelnut and regenerating aspen.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
ASPEN SAPLINGS *(Populus tremuloides)*	17	6-27	100
BEAKED HAZELNUT *(Corylus cornuta)*	38	21-55	100
ROSE *(Rosa acicularis)*	14	4-23	100
SASKATOON *(Amelanchier alnifolia)*	7	5-8	100
WILD RED RASPBERRY (*Rubus idaeus*)	5	1-10	100
SNOWBERRY (*Symphoricarpos occidentalis*)	5	4-5	100
FORBS			
WILD SARSAPARILLA *(Aralia nudicaulis)*	15	4-25	100
STRAWBERRY *(Fragaria virginiana)*	4	2-5	100
DEWBERRY *(Rubus pubescens)*	3	2-4	100
TALL LUNGWORT (*Mertensia paniculata*)	2	1-3	100
PALMATED COLTSFOOT *(Petasites palmatus)*	2	1-2	100
FAIRYBELLS (*Disporum trachycarpum*)	2	1-2	100
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	4	3-4	100
FRINGED BROME GRASS *(Bromus ciliolatus)*	3	1-4	100
HAIRY WILD RYE *(Elymus innovatus)*	1	1	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: MESOTROPHIC

SOIL DRAINAGE: WELL

ELEVATION: 686 M

SLOPE: LEVEL

FORAGE PRODUCTION IN KG/HA:n=1

GRASS	742
FORBS	190
SHRUBS	104
TOTAL	1036

SUGGESTED GRAZING
2.0 HA/AUM

I8: Aspen/ Willow/ Purple Oat Grass/ Dwarf Bilberry

(Populus tremuloides/ Salix spp./ Schizachne purpurascens/ Vaccinium caespitosum)

n=1 This community type was formed by selectively logging a White Spruce - Aspen forest. After the trees were harvested, the aspen suckered vigorously, choking out the white spruce seedlings. Succession back to a mixedwood white spruce - aspen forest will be very slow.

This community type has a fairly high water table, which has allowed willows to proliferate. The denseness of the willows makes access into this community type difficult for livestock and therefore use is limited. This community type would be, at best, considered as secondary range. It is in good range condition.

PLANT COMPOSITION

	CANOPY COVER(%) MEAN	RANGE	CONST.
SHRUBS			
ASPEN SAPLINGS *(Populus tremuloides)*	75	-	100
WILLOW *(Salix spp.)*	40	-	100
DWARF BILBERRY *(Vaccinium caespitosum)*	11	-	100
SASKATOON *(Amelanchier alnifolia)*	3	-	100
RASPBERRY *(Rubus idaeus)*	2	-	100
TWINFLOWER *(Linnaea borealis)*	6	-	100
FORBS			
STRAWBERRY *(Fragaria virginiana)*	6	-	100
SMOOTH ASTER *(Aster laevis)*	4	-	100
DANDELION *(Taraxacum officinale)*	4	-	100
AMERICAN HEDYSARUM *(Hedysarum alpinum)*	3	-	100
WHITE CLOVER *(Trifolium repens)*	3	-	100
MEADOW PARSNIP *(Zizia aptera)*	2	-	100
PALMATE-LEAVED COLTSFOOT *(Petasites palmatus)*	2	-	100
STAR-FLOWERED SOLOMON'S-SEAL *(Smilacina stellata)*	2	-	100
GRASSES			
PURPLE OAT GRASS *(Schizachne purpurascens)*	22	-	100
UPLAND SEDGE *(Carex spp.)*	11	-	100
SLENDER WHEAT GRASS *(Agropyron trachycaulum)*	3	-	100
HAIRY WILD RYE *(Elymus innovatus)*	2	-	100
BALTIC RUSH *(Juncus balticus)*	2	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: HYGRIC
NUTRIENT REGIME: MESOTROPHIC
SOIL DRAINAGE: IMPERFECTLY
ELEVATION: 914 M
SLOPE: LEVEL

PRODUCTION IN KG/HA: n=1

GRASS	240
FORBS	116
SHRUBS	1400
TOTAL	1756

SUGGESTED GRAZING
2.4 HA/AUM

19: Moss/ Marsh Reed Grass

(Moss spp./ Calamagrostis canadensis)

N=7 This community type was formed by logging a White Spruce/feathermoss forest type. The lower soil pH and higher soil moisture restricted aspen suckering, however it has allowed willows to proliferate, thereby restricting white spruce seedling emergence.

The denseness of the willows makes access into this community type difficult for livestock and therefore use is limited. This community type would be, at best, considered as secondary range. It is in good range condition.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
WILLOW (Salix spp.)	2	1-8	100
ROSE (*Rosa acicularis*)	2	1-11	100
BOG CRANBERRY (*Vaccinium vitis-idaea*)	2	0-5	86
ASPEN SAPLINGS (*Populus tremuloides*)	1	0-5	71
FORBS			
FIREWEED (*Epilobium angustifolium*)	1	1-5	100
TALL LUNGWORT (*Mertensia paniculata*)	1	1-2	86
CREAM-COLOURED VETCHLING (*Lathyrus ochroleucus*)	1	0-2	86
STRAWBERRY (*Fragaria virginiana*)	3	2-5	71
PALMATED COLTSFOOT (*Petasites palmatus*)	1	0-2	71
COMMON DANDELION (*Taraxacum officinale*)	1	0-6	71
GRASSES			
MARSH REED GRASS (*Calamagrostis canadensis*)	9	3-28	100
HAIRY WILD RYE (*Elymus innovatus*)	6	1-11	100
SEDGE SPP. (*Carex spp.*)	5	0-15	71
MOSSES			
MOSS SPP.	73	33-99	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: MESOTROPHIC TO PERMESOTROPHIC

SOIL DRAINAGE: WELL

ELEVATION: 1234 M

SLOPE: (2-5%)

FORAGE PRODUCTION IN KG/HA: n=4

GRASS	1184 (855-1786)
FORBS	455 (84-813)
SHRUBS	116 (45-232)
TOTAL	1755 (1079-2129)

SUGGESTED GRAZING
3.7 HA/AUM

110: Aw/ Bracted honeysuckle/ horsetail

(Populus tremuloides/ Lonicera involucrata/ Equisetum spp.)

N=1 This community type was formed by harvesting a Aw/bracted honeyscuckle forest type . After the trees were harvested, aspen and balsam saplings suckered vigorously along with various shrubs. The soil moisture/nutrient regime permitted a high diversity, and production of shrubs, and forbs to develop.

The denseness of the trees and shrubs makes access into this community type difficult for livestock and therefore use is limited. This community type would be, at best, considered as secondary range. It is in excellent range condition.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
ASPEN (*Populus tremuloides*)	20	-	100
BALSAM POPLAR (*Populus balsamifera*)	10	-	100
SHRUBS			
ASPEN SAPLINGS (*Populus tremuloides*)	22	-	100
BRACTED HONEYSUCKLE (*Lonicera involucrata*)	15	-	100
WILD RED RASPBERRY (*Rubus idaeus*)	10	-	100
CURRANT SPP. (*Ribes spp.*)	9	-	100
BALSAM POPLAR SAPLINGS (*Populus balsamifera*)	8	-	100
RIVER ALDER (*Alnus tenuifolia*)	4	-	100
PAPER BIRCH SAPLINGS (*Betula papyrifera*)	3	-	100
ROSE *(Rosa acicularis)*	3	-	100
FORBS			
COMMON FIELD HORSETAIL (*Equisetum arvense)*	10	-	100
MEADOW HORSETAIL (*Equisetum pratense*)	10	-	100
DEWBERRY (*Rubus pubescens*)	4	-	100
WILD SARSAPARILLA *(Aralia nudicaulis)*	3	-	100
BUNCHBERRY (*Cornus canadensis*)	3	-	100
LINDLEY'S ASTER (*Aster ciliolatus*)	2	-	100
FIREWEED (*Epilobium angustifolium*)	2	-	100
TALL LUNGWORT (*Mertensia paniculata*)	2	-	100
STRAWBERRY *(Fragaria virginiana)*	2	-	100
PALMATED COLTSFOOT *(Petasites palmatus)*	2	-	100
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	5	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC
NUTRIENT REGIME: MESOTROPHIC
SOIL DRAINAGE: IMPERFECTLY
ELEVATION: 950 M
SLOPE: (2-5%)
ASPECT: SOUTHWESTERLY

FORAGE PRODUCTION IN KG/HA:n=0

GRASS*	1200 *estimated
FORBS*	800
SHRUBS*	500
TOTAL*	2500

SUGGESTED GRAZING
1.5 HA/AUM

l11: Marsh Reed Grass/ Balsam Poplar/ Raspberry/ Fireweed

(Calamagrostis canadensis/ Populus balsamifera/ Rubus idaeus/ Epilobium angustifolium)

n=2 This community type formed after harvesting an deciduous stand, i.e. f4: Aw-Pb-Bw/rose/marsh reed grass which were used as skiing runs down Whitecourt Mountian. Without continued disturbance these linear disturbances will slowly revert back to an Aw-Pb stand due to shrub and tree encroachment from neighbouring mature deciduous stands.

This community type can provide excellent grazing opportunities, but without grazing tree and shrub densities will likely create a secondary range for domestic use.

PLANT COMPOSITION

	CANOPY COVER(%) MEAN	RANGE	CONST.
SHRUBS			
BALSAM SAPLINGS *(Populus balsamifera)*	9	3-15	100
ASPEN SAPLINGS *(Populus tremuloides)*	3	0-5	50
PAPER BIRCH *(Betula papyrifera)*	3	0-5	50
RASPBERRY *(Rubus idaeus)*	7	2-11	100
WILLOW *(Salix spp.)*	2	1-3	100
HONEYSUCKLE *(Lonicera involucrata)*	3	0-5	50
LOW-BUSH CRANBERRY *(Viburum edule)*	1	1	100
FORBS			
TALL LUNGWORT *(Mertensia paniculata)*	9	6-11	100
FIREWEED *(Epilobium angustifolium)*	6	5-6	100
COWPARSNIP *(Heracleum lanatum)*	5	5	100
VEINY MEADOWRUE *(Thalictrum venulosum)*	5	1-9	100
OAK FERN *(Gymnocarpium dryopteris)*	5	1-7	100
PALMATED COLTSFOOT *(Petasites palmatus)*	3	1-5	100
BANEBERRY *(Actaea rubra)*	3	2-3	100
LINDLEY'S ASTER *(Aster ciliolatus)*	2	1-2	100
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	22	11-32	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC
NUTRIENT REGIME: PERMESOTROPHIC
SOIL DRAINAGE: MODERATELY WELL
ELEVATION: 1171 M
SLOPE: 25%
ASPECT: EASTERLY

FORAGE PRODUCTION KG/HA: N=2

GRASS	1853 (432-3274)
FORBS	1044
SHRUBS	53 (0-106)
TOTAL	4424

SUGGESTED GRAZING
1.5 HA/AUM

112: Balsam Poplar/Green Alder/ Marsh Reed Grass

(Populus balsamifera/ Alnus crispa/ Calamagrostis canadensis)

n=1 This community type formed after clear-cut logging an Aw-Pb/green alder forest community type. This area is effected by a high (or perched) water table as indicated by the presence of balsam saplings and green alder The high water table in this community type may be partially caused by the clear-cutting. Clear-cutting deciduous stands causes the water table to rise because, even though the amount of water going into the site is the same, the amount of transpiration and water leaving the site is greatly reduced.

This community type may provide good grazing opportunities as a mature stand; however the density of green alder and balsam poplar will restrict domestic access until natural thinning occurs in later seral stages.

PLANT COMPOSITION

	CANOPY COVER(%) MEAN	RANGE	CONST.
SHRUBS			
BALSAM SAPLINGS *(Populus balsamifera)*	23	-	100
GREEN ALDER *(Alnus crispa)*	18	-	100
RASPBERRY *(Rubus idaeus)*	14	-	100
ROSE *(Rosa acicularis)*	8	-	100
SNOWBERRY *(Symphoricarpos occidentalis)*	5	-	100
LOW-BUSH CRANBERRY *(Viburum edule)*	2	-	100
FORBS			
HEART-LEAVED ARNICA *(Arnica cordifolia)*	11	-	100
COWPARSNIP *(Heracleum lanatum)*	9	-	100
STRAWBERRY *(Fragaria virginiana)*	5	-	100
SHOWY ASTER *(Aster conspicuus)*	4	-	100
WILD SARSAPARILLA *(Aralia nudicaulis)*	4	-	100
FIREWEED *(Epilobium angustifolium)*	4	-	100
LINDLEY'S ASTER *(Aster ciliolatus)*	4	-	100
AMERICAN VETCH *(Vicia americana)*	4	-	100
COMMON HORSETAIL *(Equisetum arvense)*	2	-	100
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	14	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC
NUTRIENT REGIME: PERMESOTROPHIC
SOIL DRAINAGE: MODERATELY WELL
ELEVATION: 1128 M
SLOPE: 5-7 %
ASPECT: NORTHERLY

FORAGE PRODUCTION IN KG/HA:

TOTAL 2750 *
*ESTIMATED

SUGGESTED GRAZING
1.5 HA/AUM

113: Marsh Reed Grass/ Bw-Aw/ Willow

(Calamagrostis canadensis/ Betula glandulosa- Populus tremuloides/ Salix spp.)

n=1 This community type formed after clear-cut logging a mature Aspen - Balsam Poplar forest. It is fairly moist and maintains a high water table. The high moisture regime on this site allows moisture-adapted species such as paper birch, balsam poplar, willow, and field horsetail to predominate.

This community type has never been grazed by domestic livestock and is in excellent range condition.

PLANT COMPOSITION

	CANOPY COVER(%) MEAN	RANGE	CONST.
TREES			
PAPER BIRCH *(Betula papyrifera)*	5	-	100
WHITE SPRUCE *(Picea glauca)*	5	-	100
BALSAM POPLAR *(Populus balsamifera)*	5	-	100
ASPEN *(Populus tremuloides)*	2	-	100
SHRUBS			
PAPER BIRCH SAPLINGS *(Betula papyrifera)*	10	-	100
WILLOW *(Salix spp.)*	26	-	100
ASPEN SAPLINGS *(Populus tremuloides)*	9	-	100
BALSAM POPLAR SAPLINGS *(Populus balsamifera)*	5	-	100
BRACTED HONEYSUCKLE *(Lonicera involucrata)*	3	-	100
CURRANT SPP. (*Ribes spp.*)	3	-	100
FORBS			
FIELD HORSETAIL *(Equisetum arvense)*	27	-	100
LINDLEY'S ASTER (*Aster ciliolatus*)	5	-	100
FIREWEED *(Epilobium angustifolium)*	4	-	100
CANADA GOLDENROD (*Solidago canadensis*)	4	-	100
SHOWY ASTER (*Aster conspicuus*)	3	-	100
TALL LUNGWORT (*Mertensia paniculata*)	1	-	100
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	43	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC
NUTRIENT REGIME: PERMESOTROPHIC
SOIL DRAINAGE: MODERATELY WELL
ELEVATION: 884 M
SLOPE: 1%
ASPECT: NORTHERLY

FORAGE PRODUCTION KG/HA:

GRASS	1492
FORBS	1264
SHRUBS	420
TOTAL	3176

SUGGESTED GRAZING
1.5 HA/AUM

114: Lodgepole Pine- White Spruce/ Green Alder/ Fireweed

(Pinus contorta- Picea glauca/ Alnus crispa/ Epilobium angustifolium)

n=3 This community type is formed by clear-cut logging a mature Lodgepole Pine/ Green Alder community type. It is supplied with water from upslope which enables the site to support a healthy stand of green alder. Fireweed became dominant on this site after harvest because of its ability to quickly establish on disturbed sites.

In areas where the shrub cover is low, the lush understory may make this community type attractive to grazing livestock. Where the shrub cover is high and productivity is lower as a result of shading, this community type would be considered non-use.

This community type is in good range condition.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
SHRUBS			
LODGEPOLE PINE SAPLINGS *(Pinus contorta)*	8	2-17	100
WHITE SPRUCE SAPLINGS *(Picea glauca)*	3	2-5	68
GREEN ALDER *(Alnus crispa)*	16	12-18	100
RASPBERRY *(Rubus idaeus)*	11	6-13	100
WHITE MEADOWSWEET *(Spiraea betulifolia)*	2	1-6	68
ROSE *(Rosa acicularis)*	2	1-6	68
FORBS			
FIREWEED *(Epilobium angustifolium)*	56	25-72	100
BUNCHBERRY *(Cornus canadensis)*	5	1-5	100
WILD SARSAPARILLA *(Aralia nudicaulis)*	12	0-22	68
SHOWY ASTER *(Aster conspicuus)*	2	2-5	68
COW PARSNIP *(Heracleum lanatum)*	5	13	33
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	7	5-7	100
UPLAND SEDGES *(Carex spp.)*	3	1-7	100
HAIRY WILD RYE *(Elymus innovatus)*	7	1-18	68
MOSSES			
Moss spp.	7	1-20	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: MESOTROPHIC TO PERMESOTROPHIC

SOIL DRAINAGE: MODERATELY WELL

ELEVATION: 1340 - 1680 M

SLOPE: 5 - 35 %

ASPECT: EASTERLY

FORAGE PRODUCTION KG/HA: N=2

GRASS	325 (200-450)
FORBS	1210 (410-2010)
SHRUBS	1075 (980-1170)
TOTAL	2610 (1780-3440)

SUGGESTED GRAZING
1.5 HA/AUM

l15: White Spruce/ Willow/ Marsh reed grass

(Picea glauca/ Salix spp./ Calamagrostis canadensis)

n=1 This community type is formed by clear-cut logging a mature white spruce forest. The presence of willow, cowparnsip, horestail, and tall larkspur indicates a relatively high soil moisture availability; as well, smooth brome, and clover, indicate a moderate level of disturbance via seeding or grazing.

Where the shrub cover is high and productivity is lower as a result of shading, this community type would be considered non-use.

PLANT COMPOSITION

	CANOPY COVER(%) MEAN	RANGE	CONST.
TREES			
WHITE SPRUCE (*Picea glauca*)	5	-	100
SHRUBS			
WHITE SPRUCE SAPLINGS (*Picea glauca*)	10	-	100
WILLOW (*Salix spp.*)	8	-	100
ROSE (*Rosa acicularis*)	15	-	100
RASPBERRY (*Rubus idaeus*)	7	-	100
SNOWBERRY (*Symphoricarpos alba*)	2	-	100
BRACTED HONEYSUCKLE (*Lonicera involucrata*)	1	-	100
FORBS			
COWPARSNIP (*Heracleum lanatum*)	7	-	100
CANADA GOLDENROD (*Solidago canadensis*)	7	-	100
WESTERN WILLOW ASTER (*Aster hesperius*)	5	-	100
NARROW-LEAVED HAWKWEED (*Hieracium umbellatum*)	4	-	100
VEINY MEADOWRUE (*Thalictrum venulosum*)	4	-	100
CLOVER SPP. (*Trifolium spp.*)	4	-	100
THREE-LEAVED FALSE SOLOMON'S-SEAL (*Smilacina trifolia*)	3	-	100
TALL LARKSPUR (*Delphinium glaucum*)	3	-	100
SWAMP HORSETAIL (*Equisetum fluviatile*)	2	-	100
GRASSES			
MARSH REED GRASS (*Calamagrostis canadensis*)	35	-	100
SMOOTH BROME (*Bromus inermis.*)	25	-	100
SLENDER WHEAT GRASS (*Agropyron trachycaulum*)	10	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC

NUTRIENT REGIME: PERMESOTROPHIC

SOIL DRAINAGE: MODERATELY WELL

ELEVATION: 721 M

SLOPE: 20 %

ASPECT: EASTERLY

FORAGE PRODUCTION KG/HA: N=1

GRASS	761
FORBS	846
SHRUBS	1
TOTAL	1608

SUGGESTED GRAZING
3.1 HA/AUM

I16: Lodgepole pine-Black Spruce/ Labrador tea/ Horsetail/ Moss

(Pinus contorta var. latifolia - Picea glauca/ Ledum groenlandicum./ Equisetum arvense/ Moss spp.)

n=2 This community type is formed by clear-cut logging a mature Black Spruce - Lodgepole Pine forest community. The dominance of black spruce, labrador tea indicate a relatively moist but poor nutrient soil condition. The dominance of shrubs and unpalatable understorey make this type unsuitable for domestic grazing.

PLANT COMPOSITION

	CANOPY COVER(%) MEAN	RANGE	CONST.
SHRUBS			
LODGE-POLE PINE *(Pinus contorta var. latifolia)*	35	25-45	100
BLACK SPRUCE *(Picea mariana)*	11	10-13	100
PAPER BIRCH *(Betula papyrifera)*	6	2-10	100
WILLOW *(Salix spp.)*	10	10	100
LABRADOR TEA *(Ledum groenlandicum)*	16	7-25	100
BOG CRANBERRY *(Vaccinium vitis-idaea)*	2	1-3	100
BRACTED HONEYSUCKLE *(Lonicera involucrata)*	2	1-2	100
FORBS			
WOODLAND HORSETAIL *(Equisetum sylvaticum)*	4	3-5	100
COMMON HORSETAIL *(Equisetum arvense)*	3	2-4	100
FIREWEED *(Epilobium angustifolium)*	3	1-4	100
LINDLEY'S ASTER	2	1-2	100
STRAWBERRY *(Fragaria virginiana)*	1	1-2	100
PALAMATED COLTSFOOT *(Petasites palmatus)*	1	1-2	100
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	2	1-2	100
MOSSES			
MOSS SPP.	48	0-95	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: SUBHYGRIC TO SUBHYDRIC
NUTRIENT REGIME: PERMESOTROPHIC
SOIL DRAINAGE: IMPERFECTLY TO POORLY
ELEVATION: 600 M
SLOPE: 1-3%
ASPECT: EASTERLY/WESTERLY

FORAGE PRODUCTION KG/HA:

TOTAL = 850*
*ESTIMATED

SUGGESTED GRAZING
0.0 HA/AUM
NON-USE

117: Willow/ Hair sedge/White spruce

(Salix spp./ Carex capillaris/ Picea glauca)

n=4 This community type is formed by clear-cut logging a mature White Spruce - Black Spruce community type. A relatively high water table after logging has allowed willow and sedge species to dominate the site, and restricting emergence of planted spruce seedlings.

These conditions as make this community type unsuitable for domestic livestock grazing with the dominance of unpalatable forage species. This community type is considered non-use.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
WHITE SPRUCE *(Picea glauca)*	1	1-3	100
SHRUBS			
WILLOW *(Salix spp.)*	36	30-41	100
BUFFALO-BERRY *(Sheperdia canadensis)*	2	1-4	100
ROSE *(Rosa acicularis)*	2	1-3	75
SHRUBBY CINQUEFOIL *(Potentilla fruticosa)*	2	0-3	75
FORBS			
NORTHERN BEDSTRAW *(Galium boreale)*	5	3-6	100
PALMATED COLTSFOOT *(Petasites palmatus)*	2	1-4	100
COMMON HAREBELL *(Campanula rotundifolia)*	1	1	100
LINDLEY'S ASTER *(Aster ciliolatus)*	4	1-8	75
SWAMP HORESTAIL *(Equisetum fluviatile)*	3	1-8	75
WOOLLY PUSSYTOES *(Antennaria lanata)*	2	2	75
SMALL WOOD ANEMONE *(Anemone parviflora)*	2	1-2	75
GRASSES:			
HAIR SEDGE *(Carex capillaris)*	15	7-23	100
HAIRY WILD RYE *(Elymus innovatus)*	12	1-20	100
WIRE RUSH *(Juncus balticus)*	2	1-2	100
KENTUCKY BLUE GRASS *(Poa pratensis)*	1	0-4	75

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: HYGRIC
NUTRIENT REGIME: PERMESOTROPHIC
SOIL DRAINAGE: POOR
ELEVATION: 1152 M
SLOPE: 3 %
ASPECT: WESTERLY

FORAGE PRODUCTION KG/HA:

TOTAL = 650*
*ESTIMATED

SUGGESTED GRAZING
0.0 HA/AUM
NON-USE

GRAZED MODIFIED FOREST CUTBLOCK COMMUNITY TYPES

OF THE

LOWER FOOTHILLS SUBREGION

Photo 18: An aspen grazed modified cutblock community type within the Lower Foothills Subregion. Aspen forests within the Lower Foothills Subregion are under increasing demands from the timber and livestock industries. These community types illustrate the effects of moderate to heavy grazing regimes on early successional forest communities following harvesting.

Grazed Modified Forest Cutblocks

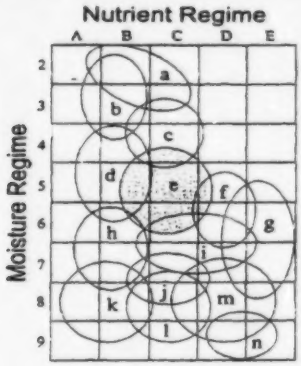
The effects of domestic livestock grazing on forest cutblocks is varied depending on site and imposed management practices. Generally, imposing a seasonal light grazing regime (< 25% utilization) on cutblock area does not effect deciduous or conifer regeneration. However, when seasonal moderate to heavy grazing regimes (>30% utilization) are imposed livestock foraging and trampling damage has a significant effect on regeneration (Table 13).

Table 13. Characteristics of aspen regeneration under three skidding treatments, following 2 years of moderate grazing (Lane 1998).

Skidding Intensity	**Aspen density (stems/ha)**		**Aspen stem height (cm)**		**Aspen Stem diameter (mm)**		**Aspen Biomass (kg/ha)**	
	Ungrazed	Grazed	Ungrazed	Grazed	Ungrazed	Grazed	Ungrazed	Grazed
Light	34 300	26 000	99	59	12	8	1 640	300
Heavy	33 100	21 500	72	43	9	7	547	294
Very Heavy	13 200	11 400	55	35	8	6	255	47
Average	26 900	19 600	76	46	10	7	814	214
Reduction (%)	27		39		30		74	

The grazed modified community types described in this section are due to moderate to heavy grazing regimes imposed over several years and thereby have restricted the regrowth of deciduous and coniferous seedlings. In order to sustain required regeneration standards domestic grazing must be restricted to allow replanted seedlings to establish and dominate the area. If these retreated cutblocks become properly regenerated domestic grazing can again be imposed; however, the stocking (ha/AUM) must be based on a mature forested community, thereby most aspen and conifer communities would have a sustained grazing level of < or = 2.0 ha/AUM. A summary of Aw grazed modified cutblocks is provided within e2_harvest_grazed ecosite phase.

e2 low-bush cranberry_harvest_grazed Aw n=17



CHARACTERISTIC SPECIES

Understory Tree

[5] aspen*
[2] balsam poplar*
[1] white spruce*

Shrub

[5] prickly rose
[2] wild red raspberry*
[2] aspen*
[2] willow*
[1] green alder*
[1] Canada buffalo-berry*
[1] twin-flower*

Forb

[22] clover spp.
[10] wild strawberry
[7] dandelion
[4] fireweed
[3] Lindley's aster*
[2] common yarrow
[2] dewberry*
[1] cream-colored vetchling
[1] wild lily-of-the-valley
[1] bunchberry*
[1] palmate-leaved coltsfoot*
[1] american vetch*

Grass

[13] kentucky bluegrass
[5] marsh reedgrass
[4] hairy wild-rye
[3] timothy*
[3] sedge spp.*

SITE CHARACTERTISTICS

Moisture Regime: subhyric[4], mesic[2]
Nutrient Regime: rich[4], medium[2]
Topographic Position: lower slope[3], mid slope[1], upper slope[2]
Slope: (2-5)[4], (10-15)[2]
Aspect: northerly[3], westerly[3]

SOIL CHARACTERISTICS**

Organic Thickness: (6-15)[6], (0-5)[4]
Humus Form: mor[6], raw moder[3]
Surface Texture: SiL[2], SL[2], L[1], Si[1]
Effective Texture: C[3],CL[2], SCL[1], SiC[1], SiCL[1]
Depth to Mottles/Gley: none[7], (0-25)[2]
Drainage: well[5], mod.well[4], imperfect[1]
Parent Material: M[5], GF[1]
Soil Subgroup: O.GL[3], BR.GL[3], GL.GL[1],E.EB[1]
Soil type: SM4[8], SD4[1]

PLANT COMMUNITY TYPES (N)

m3 Aw/buffalo-berry/clover (1)
m4 strawberry-clover/rose/marsh reedgrass (7)
m5 kentucky bluegrass/clover-dandelion (9)

FORAGE PRODUCTION (KG/HA) N=9

Grass 834 (152-2448)
Forb 382 (116-1218)
Shrub 202 (0-1400)
Total 1418 (400-2888)

SUGGESTED GRAZING CAPACITY HA/AUM

Cutblock Regeneration (e2_Aw):2.0

* Species characteristic of the phase but occurring in <70% of the sample plots with a prominence value <20.
** Soil Characteristics are from f2 bracted honeysuckle Aw-Pb Ecosite Phase summary.

m1: Aspen- Lodgepole Pine/ Alder/ Clover/ Kentucky Bluegrass

(Populus tremuloides- Pinus contorta/ Alnus crispa/ Trifolium repens/ Poa pratensis)

n=4 This community type formed by clear-cut logging a mature Lodgepole Pine/Green Alder community type and then broadcasting creeping red fescue and clover seed over the cutblock. Lodgepole pine has not yet been able to reestablish on this site because of the high competition from aspen and green alder. As the aspen grows it will shade out the green alder, undergo natural thinning, and then allow lodgepole pine to reestablish on the site.

This community type produces good forage and, if it occurs in an attractive area for the livestock, may be considered as primary range. It is also considered to be in good range condition.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
ASPEN			
(Populus tremuloides)	32	12-65	100
LODGEPOLE PINE			
(Pinus contorta)	19	0-50	75
SHRUBS			
GREEN ALDER			
(Alnus crispa)	11	0-20	75
RASPBERRY			
(Rubus idaeus)	3	0-5	100
ROSE			
(Rosa acicularis)	5	0-18	100
LOW BUSH CRANBERRY			
(Viburnum edule)	1	0-4	75
FORBS			
WHITE CLOVER			
(Trifolium repens)	22	4-34	100
DANDELION			
(Taraxacum officinale)	8	4-13	100
STRAWBERRY			
(Fragaria virginiana)	7	0-16	100
WILD LILY-OF-THE-VALLEY			
(Maianthemum canadense)	1	0-1	100
COMMON YARROW			
(Achillea millefolium)	2	0-3	75
FIREWEED			
(Epilobium angustifolium)	2	0-3	75
PALMATE-LEAVED COLTSFOOT			
(Petasites palmatus)	1	0-2	75
BUNCHBERRY			
(Cornus canadensis)	3	0-9	50
LINDLEY'S ASTER			
(Aster laevis)	2	0-4	50
GRASSES			
MARSH REED GRASS			
(Calamagrostis canadensis)	3	0-5	100
KENTUCKY BLUEGRASS			
(Poa pratensis)	8	0-25	75
TIMOTHY			
(Phleum pratense)	6	0-16	75
CREEPING RED FESCUE			
(Festuca rubra)	12	0-40	50

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC
NUTRIENT REGIME:
MESOTROPHIC
SOIL DRAINAGE:
MODERATELY WELL
ELEVATION (MEAN):
1082-1372 (1185)M
SLOPE: 2-5%
ASPECT: NORTHERLY

FORAGE PRODUCTION (KG/HA) N=3

GRASS	885 (356-1500)
FORBS	821 (734-980
SHRUBS	503 (110-700)
TOTAL	2210 (1200-3180)

SUGGESTED GRAZING
3.0 HA/AUM

m2: Aspen/ Buffalo-berry/ Clover

(Populus tremuloides/ Shepherdia canadensis/ Trifolium spp.)

n=1 This community type describes the effects of harvesting and grazing disturbances on mature deciduous community type. The adequate moisture/nutrient regime has held tree and shrub production in good standing ;however, the presence of periodic, intensive grazing has altered the herbaceuous understory by the dominance of clover, dandelion, and to a lesser extent strawberry. This system should be able to sustain deciduous regeneration while maintaining a long-term forage base for domestic grazing.

PLANT COMPOSITION

	CANOPY COVER(%) MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	30	-	100
BALSAM POPLAR *(Populus balsamifera)*	20	-	100
BLACK SPRUCE *(Picea mariana)*	15	-	100
WHITE OR PAPER BIRCH *(Betula papyrifera)*	3	-	100
SHRUBS			
BUFFALO-BERRY *(Shepherdia canadensis)*	15	-	100
WILLOW *(Salix spp.)*	10	-	100
BRACTED HONEYSUCKLE *(Lonicera involucrata)*	3	-	100
PRICKLY ROSE *(Rosa acicularis)*	2	-	100
WILD ROSE *(Rosa woodsii)*	2	-	100
FORBS			
ALSIKE CLOVER *(Trifolium hybridum)*	10	-	100
FIREWEED *(Epilobium angustifolium)*	6	-	100
PALMATE-LEAVED COLTSFOOT *(Petasites palmatus)*	4	-	100
BUNCHBERRY *(Cornus canadensis)*	3	-	100
COMMON YARROW *(Achillea millefolium)*	2	-	100
STRAWBERRY *(Fragaria virginiana)*	2	-	100
BISHOP'S CAP *(Mitella nuda)*	2	-	100
DEWBERRY OR RUNNING RASPBERRY *(Rubus pubescens)*	2	-	100
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	2	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
SUGHYGRIC
NUTRIENT REGIME:
PERMESOTROHIC
SOIL DRAINAGE:
MODERATELY WELL
ELEVATION:
N/A
SLOPE: N/A
ASPECT: EASTERLY

FORAGE PRODUCTION (KG/HA)

TOTAL 1200*
(*ESTIMATED)

SUGGESTED GRAZING CAPACITY
2.0 HA/AUM

m3: Strawberry- Clover/ Rose/ Marsh Reedgrass

(Fragaria viginiana - Trifolium spp./ Rosa acicularis/ Calamagrostis canadensis)

n=7 This community type describes the effects of moderate to heavy grazing of 15 Aw/marsh reed grass/rose/fireweed harvested community type. Low-growing forbs such as strawberry and clover indicate a moderate to heavy grazing regime for at least 2 to 3 growing seasons. With continued heavy grazing grazing succession will alter this to a m4: kentucky bluegrass/clover-dandelion community. In order to sustain deciduous regeneration domestic grazing must be restricted to allow aspen and balsam suckers to emerge and profilerate.

PLANT COMPOSITION

	CANOPY COVER(%) MEAN	RANGE	CONST.
TREES			
ASPEN *(Populus tremuloides)*	6	0-34	43
SHRUBS			
PRICKLY ROSE *(Rosa acicularis)*	8	3-12	100
WILLOW *(Salix spp.)*	4	0-20	57
ASPEN SAPLINGS *(Populus tremuloides)*	5	0-25	57
TWINFLOWER *(Linnea boreale)*	2	0-10	29
FORBS			
STRAWBERRY *(Fragaria virginiana)*	21	2-40	100
WHITE CLOVER *(Trifolium repens)*	16	0-40	86
FIREWEED *(Epilobium angustifolium)*	4	0-20	86
DANDELION *(Taraxacum officianalis)*	2	0-4	86
CREAM-COLORED VETCHLING (PEAVINE) *(Lathyrus ochroleucus)*	2	0-5	86
AMERICAN VETCH *(Vicia americana)*	3	0-14	71
LINDLEY'S ASTER *(Aster ciliolatus)*	4	0-12	57
INDIAN PAINTBRUSH *(Castilleja miniata)*	2	0-20	57
DEWBERRY OR RUNNING RASPBERRY *(Rubus pubescens)*	2	0-15	57
GRASSES			
MARSH REED GRASS *(Calamagrostis canadensis)*	10	1-20	100
HAIRY WILD RYE *(Elymus innovatus)*	4	0-15	71
KENTUCKY BLUEGRASS *(Poa Pratensis)*	2	0-5	57
TIMOTHY *(Phleum pratense)*	2	0-7	57

ENVIRONMENTAL VARIABLES

MOISTURE REGIME:
MESIC
NUTRIENT REGIME:
MESOTROPHIC
SOIL DRAINAGE:
MODERATELY WELL
ELEVATION (MEAN):
945-1016 (981)M
SLOPE: 0-8%
ASPECT: SOUTHEASTERLY

FORAGE PRODUCTION (KG/HA) N=3

GRASS	405 (168-806)
FORBS	331 (116-618)
SHRUBS	541 (76-1400)
TOTAL	1277 (504-1756)

SUGGESTED GRAZING
2.0 HA/AUM

m4: Kentucky bluegrass/ Clover/ Dandelion

(Poa pratensis/Trifolium spp./ Taraxacum officinale)

n=9 This community type is formed by heavily grazing an Aspen/ Rose/ Marsh Reed Grass community type. With heavy grazing, clover dandelion, and kentucky bluegrass invade into the site and eventually dominate it if heavy grazing occurs frequently. In order to sustain deciduous regeneration domestic grazing must be restricted until merchantable timber species dominate the area.

PLANT COMPOSITION

	CANOPY COVER(%) MEAN	RANGE	CONST.
SHRUBS			
ASPEN SAPLINGS *(Populus tremuloides)*	3	0-20	66
WHITE SPRUCE SEEDLINGS (*Picea glauca*)	2	0-10	66
ROSE *(Rosa acicularis)*	2	0-4	89
RASPBERRY *(Rubus idaeus)*	2	0-7	44
WILLOW (*Salix spp.*)	1	0-5	66
FORBS			
CLOVER *(Trifolium spp.)*	25	0-63	89
DANDELION *(Taraxacum officinale)*	12	0-22	89
FIREWEED *(Epilobium angustifolium)*	4	1-11	100
COMMON YARROW *(Achillea millefolium)*	3	1-5	100
STRAWBERRY *(Fragaria virginiana)*	2	0-5	89
WILD LILY OF THE VALLEY (*Maianthemum canadense*)	1	0-3	89
LINDLEY'S ASTER *(Aster ciliolatus)*	2	0-12	56
GRASSES			
KENTUCKY BLUEGRASS *(Poa pratensis)*	23	2-59	100
TIMOTHY *(Phleum pratense)*	4	0-11	78
SEDGE *(Carex spp.)*	4	0-14	78
HAIRY WILD RYE *(Elymus innovatus)*	4	0-12	78
CREEPING RED FESCUE *(Festuca rubra)*	3	0-15	22
MARSH REED GRASS *(Calamagrostis canadensis)*	1	0-3	56

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC
NUTRIENT REGIME: MESOTROPHIC
SOIL DRAINAGE: MODERATELY WELL
ELEVATION: 914 - 1250 M
SLOPE: 0 - 2%

FORAGE PRODUCTION IN KG/HA: N=6

GRASS	1048 (152-2448)
FORBS	408 (132-1218)
SHRUBS	33 (0-110)
TOTAL	1489 (400-2888)

SUGGESTED GRAZING
2.0 HA/AUM

m5: Clover/ Timothy/ Buffalo-berry/ Lodgepole Pine- White Spruce

(Trifolium spp./ Phleum pratense/ Sheperdia canadensis/ Pinus contorta- Picea glauca)

n=1 This community type represents an 8-10 year old lodgepole pine cutblock, e.g. e3.1 Aw-Sw-Pl/buffalo-berry. Some of the early regeneration has been by balsam poplar and aspen, much of which has been heavily browsed by wildlife and livestock. The presence of clover, timothy and kentucky bluegrass also indicates heavy grazing and browsing pressure. Timothy, clover and kentucky bluegrass are more resistent to heavy grazing pressure than the native forbs and grasses.

This community type provides a good forage base for domestic livestock, but the heavy grazing pressure severely restricts reforestation.

PLANT COMPOSITION CANOPY COVER(%)

	MEAN	RANGE	CONST.
TREES			
WHITE SPRUCE *(Picea glauca)*	10	-	100
LODGEPOLE PINE *(Pinus contorta)*	10	-	100
BALSAM POPLAR *(Populus balsamifera)*	3	-	100
TREMBLING ASPEN *(Populus tremuloides)*	3	-	100
SHRUBS:			
BUFFALOBERRY *(Sheperdia canadensis)*	14	-	100
ROSE *(Rosa acicularis)*	5	-	100
GREEN ALDER *(Alnus crispa)*	5	-	100
WILLOW *(Salix spp.)*	3	-	100
FORBS			
WHITE CLOVER *(Trifolium repens)*	34	-	100
STRAWBERRY *(Fragaria virginiana)*	5	-	100
COMMON YARROW *(Achillea millefolium)*	3	-	100
WILD LILY-OF-THE-VALLEY *(Maianthemum canadense)*	2	-	100
COMMON RED PAINTBRUSH *(Castilleja miniata)*	1	-	100
GRASSES			
TIMOTHY *(Phleum pratense)*	22	-	100
KENTUCKY BLUEGRASS *(Poa pratensis)*	19	-	100

ENVIRONMENTAL VARIABLES

MOISTURE REGIME: MESIC
NUTRIENT REGIME: MESOTROPHIC
SOIL DRAINAGE: WELL
ELEVATION: 1371 M
SLOPE: 1%
ASPECT: NORTH

FORAGE PRODUCTION IN KG/HA: N=1

GRASS	3090
FORBS	658
SHRUBS	322
TOTAL	4070

SUGGESTED GRAZING
2.4 HA/AUM

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